

144/220 MHz FM MULTI BANDER

TM-642A

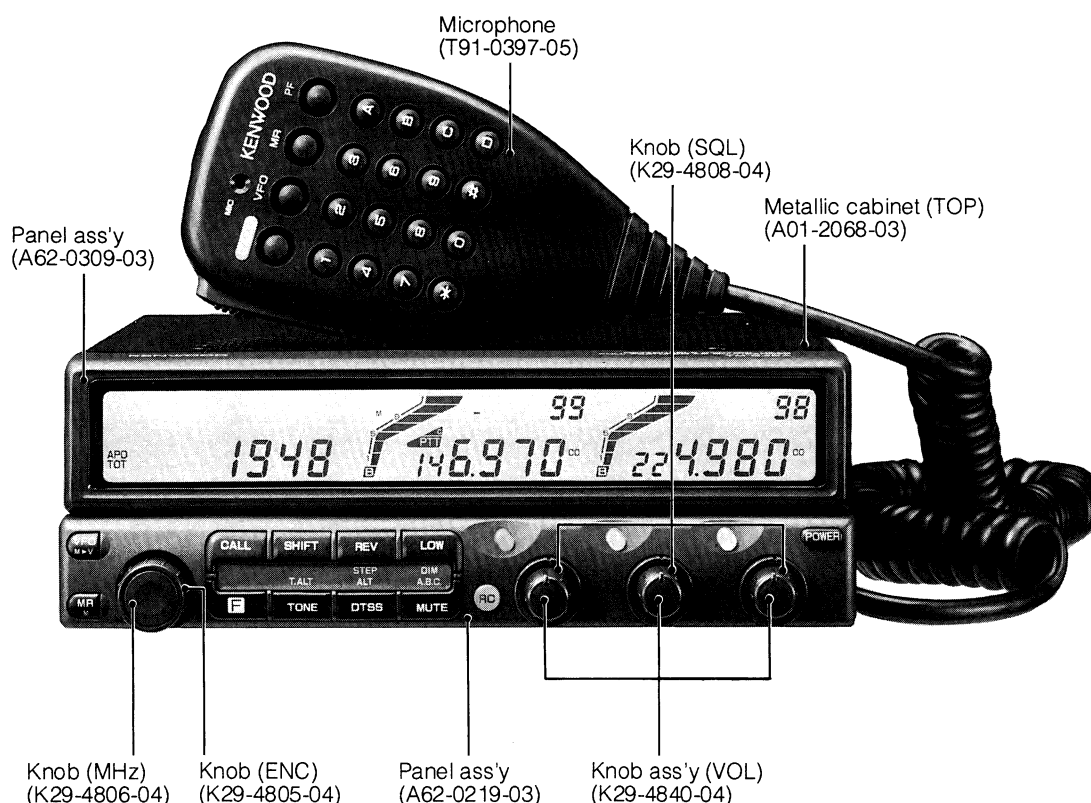
SERVICE MANUAL

KENWOOD

Bryan Fields WACR

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This service manual describes mainly about the parts list, the schematic diagram and the PC board of TM-642A. For the circuit description and the semiconductor information, refer to the service manual of TM-742A/E, TM-942A (B51-8192-00).

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Manual Scan

I hope this service manual is of use to you. Kenwood does not make this available as a PDF and all other available copies are of poor quality.

Each page is captured at 600 DPI, and as 24-bit color, 8-bit grayscale or black and white and at the proper page size, up to 11x34 inches in many cases. OCR has been performed on the document, even on the large pages. The document is condensed into one single PDF with text overlay. You should be able to print the larger sheets on 11x17 or tile them onto 8.5x11 if needed.

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This was captured on a Canon DR-G2140 scanner which is a ~7500 USD unit circa 2021. You may note some artifacts and lines in on the scans, these are due to scratches on the sensor glass, and are minor. The replacement glass is about 250 USD if you're feeling generous :-)

If you have a hard to find/out of print manual and would like to make it available please reach out, I may be able to scan and return it to you.

Thank you,

Bryan Fields, W9CR
bryan@bryanfields.net

TM-642A

OVERVIEW

List of Destinations

Model	Destination	Destination code	Model	Destination	Destination code
TM-642A	North America	K	TM-942A	North America	K
TM-742A	North America	K	TM-942A	Canada	P
TM-742A	Canada	P	TM-942A	Other countries	M
TM-742E	Europe	E			
TM-742E	Europe	E2			
TM-742E	Europe	E3			
TM-742A	Other countries	M			
TM-742A	Other countries	M2			

Units for Each Model and Destination

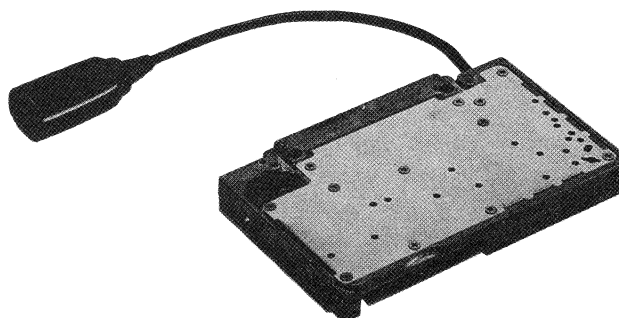
Unit Name	Parts. No.	TM-642A	TM-742A/E							TM-942A			Band Units				
		K	K	P	E	E2	E3	M	M2	K	P	M	UT-28S M (50)	UT-50S M (50)	UT-220S K (50)	UT-1200 M (10)	UT-440S K (35)
Control Unit	X53-3460-11	○	○	○						○	○						
Control Unit	X53-3460-21							○				○					
Control Unit	X53-3460-22								○								
Control Unit	X53-3462-71				○		○										
Control Unit	X53-3462-72					○											
Display Unit	X54-3130-11	○	○	○	○	○	○	○	○	○	○	○					
28TX-RX	X57-3790-01												○				
50TX-RX	X57-3800-01													○			
144TX-RX	X57-3580-11									○	○	○					
144TX-RX	X57-3580-12	○	○	○	○	○	○	○									
220TX-RX	X57-3810-10	○													○		
440TX-RX	X57-3590-12		○	○								○					○
430TX-RX	X57-3590-22							○	○								
430TX-RX	X57-3592-72				○	○	○			○	○						
1200TX-RX	X57-3600-11									○	○	○				○	

BAND UNITS

Any of the following optional band units may be installed in the TM-742A/E and TM-642A

The same instructions apply for the Tri-Bander as for the Dual-bander.

	OPTIONAL BAND UNIT
TM-642A	UT-28S UT-50S UT-440S UT-1200
TM-742A U.S.A. Version	UT-28S UT-50S UT-220S UT-1200
TM-742A	UT-28S UT-50S UT-1200
TM-742E	UT-28S UT-50S UT-1200



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TM-642A

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
TM-642A						
1	1A		A01-2068-03	METALLIC CABINET(UPPER)		
2	3A		A01-2069-03	METALLIC CABINET(BOTTOM)		
3	2F		A13-1601-02	FREM		
4	2E		A62-0206-02	PANEL (BODY)		
5	3C		A62-0219-13	PANEL ASSY (LOWER)		
6	2C		A62-0309-03	PANEL ASSY		
7	2D		A82-0012-02	BACK PANEL (UPPER)		
8	3D		A82-0013-02	BACK PANEL (LOWER)		
9	3C	*	B03-0576-04	DRESSING PLATE(FUNCTION)		
10	2D		B03-0577-04	DRESSING PLATE		
11	2B	*	B41-0686-04	CAUTION LABEL		
14	2D		B41-0696-04	CAUTION LABEL		
15	1A, 1B		B42-2455-04	LABEL(M4x8 MAX)		
16	1B		B42-3343-04	LABEL(S/NØ)		
-			B42-3394-04	LABEL(FCC)		
18	1B		B42-3498-04	LABEL(SP, ANT)		
19	2D		B42-3554-04	LABEL(M2.6x5 MAX)		
20	2J		B42-5526-04	LABEL(HYATT)		
21	3J		B44-2163-04	UPC CODE LABEL(ITEM CARTON)		
-			B44-2165-04	UPC CODE LABEL(OUTER CARTON)		
22	1I		B46-0410-30	WARRANTY CARD		
24	1I	*	B62-0287-60	INSTRUCTION MANUAL		
27	1B		B72-0672-04	MODEL NAME PLATE		
28	1E		D32-0417-04	STOPPER		
29	1A, 2B		E23-0676-04	TERMINAL		
-			E30-3006-08	CURL CORD		
31	2I		E30-3034-05	DC CORD (ACSY)		
32	2A, 2D		E30-3135-15	CONNECTING WIRE(COMMON-PANEL)		
33	2E		E37-0006-05	CONNECTING WIRE(SPEAKER)		
34	2F		E37-0325-05	FLAT CABLE(16P)		
35	2A, 2F		E37-0326-05	CONNECTING WIRE(FAN)		
36	3E		F01-0992-03	HEAT SINK(COMMON AVR, SP)		
37	3E		F01-0993-04	HEAT SINK		
38	1B		F07-1203-13	COVER(FAN)		
39	3D		F07-1232-04	COVER(PANEL..UPPER)		
40	1D, 2E		F07-1345-04	COVER(PANEL..LOWER)		
-			F15-0679-04	SHADE PLATE(8 KEYS)		
42	2I		F51-0017-05	FUSE(15A·ACSY)		
-			F51-0018-05	FUSE(20A·DC CORD)		
44	1E		G01-0833-04	COMPRESSION SPRING		
-			G02-0505-05	LEAF SPRING (VOL KNØB)		
50	2E		G02-0716-04	FLAT SPRING(SPEAKER)		
51	1B		G10-0663-04	NON-WOVEN FABRIC(100X85)		
52	1A, 3A		G10-0686-04	NON-WOVEN FABRIC(130X5)		
53	1E, 2F		G10-0700-04	NON-WOVEN FABRIC(60X10)		
54	1B		G10-0709-04	NON-WOVEN FABRIC(145X5)		
-			G10-0724-04	NON-WOVEN FABRIC(CASE)		
55	2F	*	G10-0739-04	SHEET(30X10SP..COM)		
56	1D		G11-0680-13	SHEET(PANEL..UPPER)		
57	3D		G11-0681-23	SHEET(PANEL..LOWER)		
-			G11-0688-04	SHEET(CPU...50X25)		

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TM-642A

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
-			G11-0690-14	SHEET(30X30・・ENCODER)		
58	3B, 2E		G53-0508-04	NON-WEVEN FABRIC(30X10)		
59	3D		G58-0508-04	NON-WEVEN FABRIC		
60	3I		H10-2696-12	POLYSTYRENE FORMED FIXTURE		
61	1I	*	H13-0861-04	PROTECTION BOARD		
62	3I	*	H13-0897-04	PROTECTION BOARD(150X30)		
63	2I		H25-0029-04	PROTECTION BAG		
64	2I		H25-0079-04	PROTECTION BAG(200X200)		
65	2J		H25-0723-04	PROTECTION BAG(230X400)		
66	3J		H52-0558-04	ITEM CARTON BOX		
-			H62-0476-04	OUTER CARTON BOX		
67	2I		J20-0319-24	MIC HOOK(ACSY)		
68	1B		J21-4308-14	MOUNTING HARDWARE(FAN)		
69	1B		J21-4352-03	MOUNTING HARDWARE		
70	1E		J21-4404-04	MOUNTING HARDWARE(RELEASE)		
71	2D		J21-4405-04	MOUNTING HARDWARE(PANEL)		
72	2J		J29-0454-03	WIRING BOARD (ACSY)		
73	1B		J42-0452-05	BUSHING		
86	3C		K29-4805-04	KNØB ENCODER		
87	3C		K29-4806-04	KNØB(BUTTON) MHZ		
89	3C		K29-4808-04	KNØB SQL		
90	3C		K29-4840-04	KNØB ASSY VOL		
-			L15-0310-25	LOW-FREQUENCY CHOKE COIL		
A	2A, 2B		N67-3006-46	SCREW (PLUS TERMINAL)		
C	2B, 3B		N30-3030-46	PAN HEAD MACHINE SCREW(UNIT)		
E	2A, 2B		N32-2606-46	FLAT HEAD MACHINE SCREW(TX-RX)		
F	1A, 1B		N33-2606-45	OVAL HEAD MACHINE SCREW(CASE)		
G	1B		N33-2614-45	OVAL HEAD MACHINE SCREW(FAN)		
H	1E		N35-2605-45	BINDING HEAD SCREW (PANEL)		
I	2I		N46-3010-46	PAN HEAD TAP SCREW (MIC HOOK)		
J	2D, 3D		N80-2006-45	PAN HEAD TAPTITE SCREW(PANEL)		
K	1D		N80-2008-45	PAN HEAD TAPTITE SCREW(PANEL)		
L	2A, 2D		N80-2605-45	PAN HEAD TAPTITE SCREW(PANEL)		
M	1A, 1B		N86-2606-45	SCREW (CASE)		
N	2F, 3F		N87-2606-46	BRAZIER HEAD TAPTITE SCREW		
O	3E		N87-2608-46	BRAZIER HEAD TAPTITE SCREW		
			N89-2005-46	PAN HEAD TAP SCREW (RELEASE)		
P	3I		N99-0331-05	SCREW SET(ACSY)		
Q	3C, 3D		N14-0552-05	NUT		
SP1	2E		T07-0268-05	SPEAKER(8 ØHM/1W)		
FAN	1B		T42-0310-25	FAN MOTOR		
MIC	1I		T91-0397-05	MICROPHONE (DTMF)		
92	2I		W01-0414-04	SPANNER(ACSY)		
701	3F		X53-3460-11	CONTROL UNIT		
702	1D		X54-3130-11	DISPLAY UNIT		
703	2B		X57-3580-12	TX-RX UNIT(144M 50W)		
704	2B		X57-3810-10	TX-RX UNIT(220M 25W)		
-			490-0160-05	SHEET (FRONT GLASS)		
-			490-0010-05	SHEET (FPC)		

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PARTS LIST

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CONTROL UNIT (X53-3460-11)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
CONTROL UNIT (X53-3460-11)						
C1 -4			CK73FB1H102K	CHIP C 1000PF K		
C5			CK73FB1E104K	CHIP C 0.10UF K		
C6			CK73FF1C105Z	CHIP C 1.0UF Z		
C7			CK73FB1E223K	CHIP C 0.022UF K		
C8			CK73FB1H102K	CHIP C 1000PF K		
C9			CK73FB1E104K	CHIP C 0.10UF K		
C10			CK73FB1H102K	CHIP C 1000PF K		
C11			CK73FB1E104K	CHIP C 0.10UF K		
C12			CK73FB1H102K	CHIP C 1000PF K		
C13			CK73FF1C105Z	CHIP C 1.0UF Z		
C14			CK73FB1E104K	CHIP C 0.10UF K		
C15			C92-0507-05	CHIP TAN 4.7UF 6.3WV		
C16 ,17			CC73FSL1H101J	CHIP C 100PF J		
C18			CK73FB1H472K	CHIP C 4700PF K		
C19			CC73FCH1H120J	CHIP C 12PF J		
C20			CK73FB1H123K	CHIP C 0.012UF K		
C21 ,22			CC73FCH1H220J	CHIP C 22PF J		
C23			CK73FB1H182K	CHIP C 1800PF K		
C24			CC73FCH1H151J	CHIP C 150PF J		
C25			CK73FB1E104K	CHIP C 0.10UF K		
C26			CK73FB1H102K	CHIP C 1000PF K		
C27			CK73FF1C105Z	CHIP C 1.0UF Z		
C28			CK73FB1E104K	CHIP C 0.10UF K		
C29 ,30			CK73FF1C105Z	CHIP C 1.0UF Z		
C31			CE04EW1A221M	ELECTRØ 220UF 10WV		
C32 -34			CK73FB1H102K	CHIP C 1000PF K		
C35			CK73FB1E104K	CHIP C 0.10UF K		
C36			CC73FCH1H121J	CHIP C 120PF J		
C37			CC73FCH1H390J	CHIP C 39PF J		
C38			CC73FCH1H330J	CHIP C 33PF J		
C39 -41			CK73FB1E103K	CHIP C 0.01UF K		
C42			CK73FB1H102K	CHIP C 1000PF K		
C43			CK73FB1E104K	CHIP C 0.10UF K		
C44			CK73FB1E103K	CHIP C 0.01UF K		
C45			CK73FB1H332K	CHIP C 3300PF K		
C46			CC73FSL1H101J	CHIP C 100PF J		
C47			CK73FB1E103K	CHIP C 0.01UF K		
C48			CK73FB1E223K	CHIP C 0.022UF K		
C49			CK73FB1E103K	CHIP C 0.01UF K		
C50			CK73FB1E104K	CHIP C 0.10UF K		
C51 ,52			CK73FB1H102K	CHIP C 1000PF K		
C53			CK73FB1E104K	CHIP C 0.10UF K		
C54			C92-0036-05	ELECTRØ 4.7UF 16WV		
C101			CK73FF1C105Z	CHIP C 1.0UF Z		
C102,103			CK73FB1H102K	CHIP C 1000PF K		
C104			CE04EW1C470M	ELECTRØ 47UF 16WV		
C105			CK73FB1H102K	CHIP C 1000PF K		
C106			CE04EW1A470M	ELECTRØ 47UF 10WV		
C107,108			CK73FB1E123K	CHIP C 0.012UF K		
C109			C92-0507-05	CHIP TAN 4.7UF 6.3WV		
C110			CK73FB1H682K	CHIP C 6800PF K		
C111			CK73FF1C105Z	CHIP C 1.0UF Z		
C112			CK73FB1H102K	CHIP C 1000PF K		

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CONTROL UNIT (X53-3460-11)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
C113			CK73FB1E103K	CHIP C 0.01UF K		
C114			CK73FB1H102K	CHIP C 1000PF K		
C115-117			CK73FB1E104K	CHIP C 0.10UF K		
C118			CK73FF1C105Z	CHIP C 1.0UF Z		
C119			CK73FB1H102K	CHIP C 1000PF K		
C122			CK73FB1E123K	CHIP C 0.012UF K		
C123			CK73FB1E104K	CHIP C 0.10UF K		
C124, 125			CE04EW1A470M	ELECTRØ 47UF 10WV		
C126			CE04EW1A471M	ELECTRØ 470UF 10WV		
C127, 128			CE04EW1A470M	ELECTRØ 47UF 10WV		
C129			CE04EW1C101M	ELECTRØ 100UF 16WV		
C130-133			CE04EW1A470M	ELECTRØ 47UF 10WV		
C134			CE04EW1C101M	ELECTRØ 100UF 16WV		
C135-137			CE04EW1A471M	ELECTRØ 470UF 10WV		
C138			CE04EW1C470M	ELECTRØ 47UF 16WV		
C139			CK73FF1C105Z	CHIP C 1.0UF Z		
C140, 141			CK73FB1H102K	CHIP C 1000PF K		
C143-145			CK73FB1E104K	CHIP C 0.10UF K		
C146, 147			CK73FF1C105Z	CHIP C 1.0UF Z		
C148			C90-2167-05	ELECTRØ 100UF 16WV		
C149			CE04EW1A101M	ELECTRØ 100UF 10WV		
C151-153			CC73FSL1H101J	CHIP C 100PF J		
C154			CE04EW1A471M	ELECTRØ 470UF 10WV		
C155-158			CK73FF1C105Z	CHIP C 1.0UF Z		
CN1			E40-5425-05	PIN CONNECTOR FOR INSIDE(21P)		
CN2			E40-5224-05	PIN CONNECTOR FOR INSIDE(16P)		
CN3			E40-3246-05	PIN CONNECTOR FOR INSIDE(2P)		
CN4			E40-3248-05	PIN CONNECTOR FOR INSIDE(4P)		
CN5			E40-5343-05	PIN CONNECTOR FOR INSIDE(9P)		
CN101-106			E40-5452-05	PIN CONNECTOR FOR INSIDE(12P)		
CN107			E40-5224-05	PIN CONNECTOR FOR INSIDE(16P)		
CN108			E40-5408-05	PIN CONNECTOR FOR INSIDE(21P)		
CN109			E40-3299-05	PIN CONNECTOR FOR INSIDE(2P)		
J1			E11-0448-05	PHONE JACK(3.5D)		
J2			E08-0876-05	RECTANGULAR RECEPTACLE(8P)		
W101			E37-0329-05	CONNECTING WIRE(7P)		
F1			F53-0054-05	FUSE(0.4A)		
F101			F53-0095-05	FUSE(1.2A)		
			G11-0691-04	AUXILIARY PART		
			G13-1396-04	FORMED PLATE		
			J30-0563-05	SPACER		
L1 ,2			L92-0131-05	CØRE		
X1			L77-1516-05	CRYSTAL RESONATOR(9.924MHZ)		
X2			L77-1441-05	CRYSTAL RESONATOR(32.768MHZ)		
X3			L78-0301-05	RESONATOR(3.58MHZ)		
X4			L78-0089-05	RESONATOR(480KHZ)		
CP1 ,2			R90-0729-05	MULTIPLE COMPONENTS (120 ØHM)		
CP3 ,4			R90-0727-05	MULTIPLE COMPONENTS (120 ØHM)		
R1 -3			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R4 -6			RK73FB2A473J	CHIP R 47K J 1/10W		
R7			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R8			RK73FB2A472J	CHIP R 4.7K J 1/10W		

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R9			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R10			RK73FB2A154J	CHIP R 150K J 1/10W		
R11			RK73FB2A223J	CHIP R 22K J 1/10W		
R12			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R13			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R14			RK73FB2A392J	CHIP R 3.9K J 1/10W		
R15			RK73FB2A183J	CHIP R 18K J 1/10W		
R16			RK73FB2A104J	CHIP R 100K J 1/10W		
R17			RK73FB2A182J	CHIP R 1.8K J 1/10W		
R18			RK73FB2A221J	CHIP R 220 J 1/10W		
R19			RK73FB2A123J	CHIP R 12K J 1/10W		
R20			RK73FB2A823J	CHIP R 82K J 1/10W		
R21			RK73FB2A224J	CHIP R 220K J 1/10W		
R22			RK73FB2A184J	CHIP R 180K J 1/10W		
R23			RK73FB2A105J	CHIP R 1.0M J 1/10W		
R24			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R25			RK73FB2A103J	CHIP R 10K J 1/10W		
R26			RK73FB2A473J	CHIP R 47K J 1/10W		
R27			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R28			RK73FB2A103J	CHIP R 10K J 1/10W		
R29			RK73FB2A104J	CHIP R 100K J 1/10W		
R30			RK73FB2A473J	CHIP R 47K J 1/10W		
R31			RK73FB2A563J	CHIP R 56K J 1/10W		
R32			RK73FB2A104J	CHIP R 100K J 1/10W		
R33			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R34			RK73FB2A334J	CHIP R 330K J 1/10W		
R35			RK73FB2A684J	CHIP R 680K J 1/10W		
R36			RK73FB2A473J	CHIP R 47K J 1/10W		
R37			RK73FB2A334J	CHIP R 330K J 1/10W		
R39			RK73FB2A101J	CHIP R 100 J 1/10W		
R40			RK73FB2A103J	CHIP R 10K J 1/10W		
R41			RK73FB2A152J	CHIP R 1.5K J 1/10W		
R42			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R43			RK73FB2A394J	CHIP R 390K J 1/10W		
R44			RK73FB2A473J	CHIP R 47K J 1/10W		
R45			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R46			R92-1291-05	CHIP R 2.7K J 1W		
R47			RK73FB2A153J	CHIP R 15K J 1/10W		
R48			RK73FB2A333J	CHIP R 33K J 1/10W		
R49			RK73FB2A223J	CHIP R 22K J 1/10W		
R50			RK73FB2A474J	CHIP R 470K J 1/10W		
R51 -53			RK73FB2A473J	CHIP R 47K J 1/10W		
R55 -57			R92-0670-05	CHIP R 0 OHM		
R58			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R59			RK73FB2A103J	CHIP R 10K J 1/10W		
R60			RK73FB2A473J	CHIP R 47K J 1/10W		
R64			RK73FB2A473J	CHIP R 47K J 1/10W		
R65 -67			RK73FB2A473J	CHIP R 47K J 1/10W		
R68			RK73FB2A474J	CHIP R 470K J 1/10W		
R69			RK73FB2A121J	CHIP R 120 J 1/10W		
R70			RK73FB2A473J	CHIP R 47K J 1/10W		
R71			RK73FB2A474J	CHIP R 470K J 1/10W		
R72			RK73FB2A682J	CHIP R 6.8K J 1/10W		
R74			RK73FB2A473J	CHIP R 47K J 1/10W		
R75			RK73FB2A473J	CHIP R 47K J 1/10W		

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PARTS LIST

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CONTROL UNIT (X53-3460-11)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
R76			RK73FB2A473J	CHIP R 47K J 1/10W		
R81 ,82			RK73FB2A121J	CHIP R 120 J 1/10W		
R83			RK73FB2A102J	CHIP R 1K J 1/10W		
R84			RK73FB2A821J	CHIP R 820 J 1/10W		
R85 -87			R92-0670-05	CHIP R 0 OHM J 1/10W		
R102-104			RK73FB2A223J	CHIP R 22K J 1/10W		
R105			RK73FB2A101J	CHIP R 100 J 1/10W		
R106,107			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R108			RK73FB2A474J	CHIP R 470K J 1/10W		
R109			RK73FB2A183J	CHIP R 18K J 1/10W		
R110			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R111			R92-0685-05	CHIP R 22 J 1/2W		
R112-114			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R115			RK73FB2A183J	CHIP R 18K J 1/10W		
R116			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R117,118			RK73FB2A183J	CHIP R 18K J 1/10W		
R119			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R120			RK73FB2A103J	CHIP R 10K J 1/10W		
R121			R92-1215-05	CHIP R 470 J 1/2W		
R122-124			RK73FB2A103J	CHIP R 10K J 1/10W		
R125-129			RK73FB2A104J	CHIP R 100K J 1/10W		
R130-133			RK73FB2A183J	CHIP R 18K J 1/10W		
R134			RK73FB2A4R7J	CHIP R 4.7 J 1/10W		
R135			RK73FB2A473J	CHIP R 47K J 1/10W		
R136,137			RK73FB2A101J	CHIP R 100 J 1/10W		
R138,139			RK73FB2A473J	CHIP R 47K J 1/10W		
R140,141			RK73FB2A101J	CHIP R 100 J 1/10W		
R142			RK73FB2A473J	CHIP R 47K J 1/10W		
R143-145			RK73FB2A4R7J	CHIP R 4.7 J 1/10W		
R146			RK73FB2A474J	CHIP R 470K J 1/10W		
R147,148			RK73FB2A183J	CHIP R 18K J 1/10W		
R149			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R150			RK73FB2A474J	CHIP R 470K J 1/10W		
R151			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R152-154			RK73FB2A474J	CHIP R 470K J 1/10W		
D1			DAN202U	DIODE		
D2 -4			MA112	DIODE		
D5			DTZ9.1(A)	DIODE		
D6			MA112	DIODE		
D101-103			DA204U	DIODE		
IC1			HD6433388A25F	IC(CPU)		
IC2			LC3564PML-12	IC(64K RAM)		
IC3			TA78L06F	IC(6V AVR)		
IC4			TC74HC133AF	IC(NAND)		
IC5			TC74HC00AF	IC(2-INPUT NAND GATE)		
IC6			S-3520CF	IC(CLOCK)		
IC7			HD74HC165FP	IC(8BIT SHIFT REGISTERS)		
IC8			BU4066BCF	IC(ANALOG SWITCH X4)		
IC9			NJM4558E	IC(OP AMP)		
IC10			TC35219F	IC(DTMF GEN)		
IC11			LC7385M	IC(DTMF DECODER)		
IC12			PST7030MT	IC(SYSTEM RESET)		
IC13,14			TC4S11F	IC(2 INPUT NAND GATE)		
IC15			TC4W66F	IC(DUAL BILATERAL SWITCH)		
IC16			TC4S66F	IC(BILATERAL SWITCH)		

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CONTROL UNIT (X53-3460-11)

DISPLAY UNIT(X54-3130-11)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
IC101 IC102 IC103 IC104, 105 IC106			CXD1095Q L7808CV NJM4558E LA4446 BU4053BF	IC(I/O EXP) IC(8V AVR) IC(OP AMP) IC(AF POWER AMP) IC(ANALOG MULTIPLEXER)		
IC108, 109 IC110 IC112 IC113 IC114			BU4053BF TC4S66F KCC06 KCX04 KCC07	IC(ANALOG MULTIPLEXER) IC(BILATERAL SWITCH) IC(VOL.) IC(SOL.) IC(AVR)		
Q1 Q2 Q3 Q4 Q5 , 6			2SC3722K(S) 2SC4116(Y) DTC114EU 2SB815(6, 7) 2SC4116(Y)	TRANSISTOR TRANSISTOR DIGITAL TRANSISTOR TRANSISTOR TRANSISTOR		
Q7 Q8 Q9 , 10 Q11 Q101			DTC114EU 2SD1757K 2SC4116(Y) DTA144EU 2SC4116(Y)	DIGITAL TRANSISTOR TRANSISTOR TRANSISTOR DIGITAL TRANSISTOR TRANSISTOR		
Q102 Q103 Q104 Q105 Q107-109			2SA1641(S, T) DTC144EK DTA144EK DTC143EK 2SD1757K	TRANSISTOR DIGITAL TRANSISTOR DIGITAL TRANSISTOR DIGITAL TRANSISTOR TRANSISTOR		
BA1			W09-0573-05	LITHIUM BATTERY		
DISPLAY UNIT(X54-3130-11)						
151 152	2D 1C		B11-1070-04 B11-1071-04	FILTER(LCD) FILTER(LCD)		
C1 C2 C3 C4 C5			CK73GB1H102K C92-0004-05 CK73GB1H102K C92-0045-05 CK73GB1H102K	CHIP C 1000PF K ELECTRO 1.0UF 16WV CHIP C 1000PF K ELECTRO 22UF 6.3WV CHIP C 1000PF K		
C6 , 7 C8 , 9 C10 -18 C19 , 20 C21 , 22			CC73GSL1H101J CC73GCH1H330J CK73GB1H102K CK73GB1H472K CK73GB1H102K	CHIP C 100PF J CHIP C 33PF J CHIP C 1000PF K CHIP C 4700PF K CHIP C 1000PF K		
C23 C101-103 C201 C202, 203 C204, 205			CK73GB1E103K CK73GB1H102K CK73GB1H102K CC73GSL1H101J CK73GB1E103K	CHIP C 0.010UF K CHIP C 1000PF K CHIP C 1000PF K CHIP C 100PF J CHIP C 0.010UF K		
C206-207 C208 C209			CK73GB1H102K C92-0047-05 CK73GB1E103K	CHIP C 1000PF K ELECTRO 47UF 6.3WV CHIP C 0.010UF K		
			E29-1112-14 E37-0309-05 E40-3262-05 E40-5587-05 E40-3262-05	CONNECTOR&TERMINAL PIN CONNECTOR FOR INSIDE(4P) PIN CONNECTOR FOR INSIDE(26P) PIN CONNECTOR FOR INSIDE(4P)		
CN1 CN2 CN3 CN101			E40-5587-05	PIN CONNECTOR FOR INSIDE(26P)		

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DISPLAY UNIT(X54-3130-11)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
CN201			E40-3262-05	PIN CONNECTOR FOR INSIDE(4P)		
153	1C		G11-0688-04	AUXILIARY PART		
154	2C		J21-4409-03	MOUNTING HARDWARE(LCD)		
155	1C		J30-0563-05	SPACER		
X1			L77-1504-05	CRYSTAL RESONATOR(4MHZ)		
Q	3C, 3D		N14-0552-05	NUT (ENC,VOL)		
CP1 -5			R90-0720-05	MULTI COMP 100K		
R1			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R2			RK73GB1J681J	CHIP R 680 J 1/16W		
R3			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R4			RK73GB1J681J	CHIP R 680 J 1/16W		
R5			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R6			RK73GB1J681J	CHIP R 680 J 1/16W		
R7			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R8			RK73GB1J681J	CHIP R 680 J 1/16W		
R9			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R10			RK73GB1J681J	CHIP R 680 J 1/16W		
R11			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R12			RK73GB1J681J	CHIP R 680 J 1/16W		
R13			RK73GB1J102J	CHIP R 1.0K J 1/16W		
R14 ,15			RK73GB1J103J	CHIP R 10K J 1/16W		
R16			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R17			RK73GB1J331J	CHIP R 330 J 1/16W		
R18			RK73GB1J473J	CHIP R 47K J 1/16W		
R19			RK73GB1J470J	CHIP R 47 J 1/16W		
R20			RK73GB1J100J	CHIP R 10 J 1/16W		
R21			RK73GB1J105J	CHIP R 1.0M J 1/16W		
R101			RK73FB2A561J	CHIP R 560 J 1/10W		
R102			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R103			RK73GB1J473J	CHIP R 47K J 1/16W		
R104			RK73FB2A272J	CHIP R 2.7K J 1/10W		
R105			RK73FB2A182J	CHIP R 1.8K J 1/10W		
R106			RK73FB2A272J	CHIP R 2.7K J 1/10W		
R201-203			RK73GB1J3R3J	CHIP R 3.3 J 1/16W		
R204,205			RK73GB1J100J	CHIP R 10 J 1/16W		
R206			RK73GB1J105J	CHIP R 1.0M J 1/16W		
R207			RK73GB1J104J	CHIP R 100K J 1/16W		
R208,209			RK73GB1J222J	CHIP R 2.2K J 1/16W		
R210			RK73GB1J223J	CHIP R 22K J 1/16W		
R211,212			RK73GB1J100J	CHIP R 10 J 1/16W		
VR1 -3			R23-9409-05	POTENTIOMETER		
S101-112			S70-0408-05	TACT SWITCH		
S113-115			S70-0409-15	TACT SWITCH		
D1			B38-0379-05	DISPLAY ASSY		
D2			MA112	DIODE		
D3 ,4			MA720	DIODE		
D5			B30-2025-05	LED		
			MA112	DIODE		
D101-105			B30-2048-05	LED		
D107-112			B30-2053-05	LED		
D114			B30-2053-05	LED		

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DISPLAY UNIT(X54-3130-11)
144M TX-RX UNIT (X57-3580-12)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
IC1 IC2 IC3 -6 IC201, 202 IC203			HD404719A32H L78LR05B-FA TC4S11F MSM5265GS-V1K TC4S11F	IC(CPU) IC IC(2 INPUT NAND GATE) IC(LCD DRIVER) IC(2 INPUT NAND GATE)		
IC204 IC205 IC206 PL1 -6 Q1			TC74HC73AF NJM78L05UA TC4S11F B30-0865-15 2SA1745(6,7)	IC IC(VOLTAGE REGULATOR/ +5V) IC(2 INPUT NAND GATE) LAMP, LED TRANSISTOR		
Q2 Q3 Q4 ,5 Q101			2SB1119(S) DTC114EU DTC144EU DTC114EU	TRANSISTOR DIGITAL TRANSISTOR DIGITAL TRANSISTOR DIGITAL TRANSISTOR		
S1			W02-1744-05	ENCODER UNIT		
144M TX-RX UNIT (X57-3580-12)						
200	2G		A10-1316-11	CHASSIS		
201	3G		B42-2437-04	LABEL(S/NØ)		
C5 C6 -9 C10 C11 C12			CC73FCH1H040C CK73FB1H102K CK73FB1E103K CC73FCH1H0R5C CC73FCH1H151J	CHIP C 4PF C CHIP C 1000PF K CHIP C 0.01UF K CHIP C 0.5PF C CHIP C 150PF J		
C13 C14 C15 C16 C18			CC73FCH1H030C CC73FCH1H0R5C CC73FCH1H150J CC73FCH1H020C CK73FB1H102K	CHIP C 3PF C CHIP C 0.5PF C CHIP C 15PF J CHIP C 2.0PF C CHIP C 1000PF K		
C19 C20 C21 C22 C23			CC73FCH1H060D CK73FB1H102K CC73FCH1H050C CK73FB1E103K CK73FB1H102K	CHIP C 6PF D CHIP C 1000PF K CHIP C 5PF C CHIP C 0.01UF K CHIP C 1000PF K		
C24 C25 C26 C29 C30			CK73FB1E103K CC45SL2H010C CK73FB1H102K CK73FB1E103K CC73FCH1H390J	CHIP C 0.01UF K CERAMIC 1PF C CHIP C 1000PF K CHIP C 0.01UF K CHIP C 39PF J		
C31 C32 C33 C34 ,35 C36 ,37			CC73FCH1H101J CK73FB1H102K CK73FB1E104K CK73BF1C105Z CK73FB1E103K	CHIP C 100PF J CHIP C 1000PF K CHIP C 0.10UF K CHIP C 1.0UF Z CHIP C 0.01UF K		
C39 C44 ,45 C46 C47 C48			CC73FCH1H010C CE04NW1C470M C92-0504-05 CE04NW1C470M C92-0003-05	CHIP C 1PF C ELECTRO 47UF 16WV CHIP TAN 0.68UF 20WV ELECTRO 47UF 16WV CHIP TAN 0.47UF 25WV		
C49 C50 C51 ,52 C53 ,54 C55			CE04NW1E100M CE04NW1C470M CK73FB1E103K CK73FB1H102K CK73BF1C105Z	ELECTRO 10UF 25WV ELECTRO 47UF 16WV CHIP C 0.01UF K CHIP C 1000PF K CHIP C 1.0UF Z		

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144M TX-RX UNIT (X57-3580-12)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
C56			CC73FUJ1H150J	CHIP C 15PF J		
C57			CK73FB1H102K	CHIP C 1000PF K		
C58			CC73FUJ1H220J	CHIP C 22PF J		
C59 , 60			CK73FB1H102K	CHIP C 1000PF K		
C61			CE04NW1C470M	ELECTRØ 47UF 16WV		
C62			CK73FB1H102K	CHIP C 1000PF K		
C63			CK73FB1E103K	CHIP C 0.01UF K		
C64			CE04NW1E100M	ELECTRØ 10UF 25WV		
C65			CE04NW1A330M	ELECTRØ 33UF 10WV		
C66			CK73FB1E103K	CHIP C 0.01UF K		
C67			CK73FB1H102K	CHIP C 1000PF K		
C68 , 69			CC73FCH1H100D	CHIP C 10PF D		
C70			CK73FB1E103K	CHIP C 0.01UF K		
C71 -73			CK73FB1H102K	CHIP C 1000PF K		
C74			CK73FB1H223K	CHIP C 0.022UF K		
C75			CE04NW1C101M	ELECTRØ 100UF 16WV		
C76			CK73EF1C105Z	CHIP C 1.0UF Z		
C77 , 78			CK73FB1H102K	CHIP C 1000PF K		
C79			CK73EF1C105Z	CHIP C 1.0UF Z		
C80			CC73FCH1H050C	CHIP C 5PF C		
C81			CC45SL2H120J	CERAMIC 12PF J		
C82			CK73FB1H102K	CHIP C 1000PF K		
C83			CK45B2H102K	CERAMIC 1000PF K		
C84			CM73F2H330J	CHIP C 33PF J		
C85			CC73FCH1H220J	CHIP C 22PF J		
C86			CC73FCH1H0R5C	CHIP C 0.5PF C		
C87			CC73FCH1H030C	CHIP C 3.0PF C		
C88			CC45SL2H560J	CERAMIC 56PF J		
C89			CC45SL2H470J	CERAMIC 47PF J		
C90 -92			CK73FB1H102K	CHIP C 1000PF K		
C93			CC73FCH1H0R5C	CHIP C 0.5PF C		
C94			CM73F2H300J	CHIP C 30PF J		
C95			CC73FCH1H020C	CHIP C 2.0PF C		
C96			CK73FB1E103K	CHIP C 0.01UF K		
C98			CK73FB1H102K	CHIP C 1000PF K		
C99			CE04NW1E100M	ELECTRØ 10UF 25WV		
C100			CK73FB1H102K	CHIP C 1000PF K		
C101			CE04NW1E100M	ELECTRØ 10UF 25WV		
C103			CK73FB1H102K	CHIP C 1000PF K		
C104			CK73FB1E103K	CHIP C 0.01UF K		
C105			CK73FB1H223K	CHIP C 0.022UF K		
C110			CC73FCH1H030C	CHIP C 3PF C		
C111			CK73FB1E103K	CHIP C 0.01UF K		
C112			CE04NW1A221M	ELECTRØ 220UF 10WV		
C113			CC73FCH1H100D	CHIP C 10PF D		
C114, 115			CC73FSL1H101J	CHIP C 100PF J		
C116			CC73FCH1H080D	CHIP C 8PF D		
C119			CE04NW1E100M	ELECTRØ 10UF 25WV		
C120-127			CC73FSL1H101J	CHIP C 100PF J		
C128, 129			CK73FB1H102K	CHIP C 1000PF K		
C130			CE04EW1C102M	ELECTRØ 1000UF 16WV		
TC1			C05-0371-05	TRIMMING CAP 10PF		
202			E22-0672-04	TERMINAL BOARD(-)		
			E22-0673-04	TERMINAL BOARD(+)		

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144M TX-RX UNIT (X57-3580-12)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
203	3H		E30-2145-15	ANT CABLE		
202	1H		E30-3007-05	DC POWER CORD		
CN1 , 2			E40-5461-05	PIN CONNECTOR(12P)		
-			E72-0406-04	TERMINAL PLATE		
J1			E11-0442-05	PHONE JACK		
J3			E23-0619-05	TERMINAL		
205	2G		F05-1531-05	FUSE		
204	1G		F10-1446-04	SHIELDING PLATE		
			F10-2010-03	SHIELDING COVER		
			F10-2012-04	SHIELDING CASE(VCO-PLL)		
			F20-1008-04	INSULATION SHEET(APC)		
			F51-0017-05	FUSE(15A)		
210	3G		G02-0600-14	FLAT SPRING(THERMAL SW)		
			G02-0705-04	FLAT SPRING		
			G02-0715-04	LEAF SPRING(APC TR)		
			G02-0718-04	FLAT SPRING(VCO)		
			G09-0426-05	SPRING(DC CORD)		
211	3G		G11-0654-04	CUSHION(VCO)		
215	3G		G11-0655-04	CUSHION(CN1,CN2)		
			G11-0660-04	CUSHION(VCO)		
			G11-0661-04	INSULATION SHEET(APC TR)		
			G13-0841-04	FORMED PLATE(XTAL)		
216	3G		G13-1337-04	CUSHION(VCO)		
214	1G		G13-1349-04	CUSHION(VCO)		
-			G53-0508-04	NON-WOVEN FABRIC		
			G13-1351-04	CUSHION(CN1,CN255)		
			J30-0564-05	SPACER		
CD1			L79-1013-05	FILTER(CDBM455C16)		
CF1			L72-0372-05	CERAMIC FILTER(CFWM455F)		
L1 -4			L34-4252-05	COIL		
L5			L40-1582-19	SMALL FIXED INDUCTOR(0.15UH)		
L6			L34-4251-05	COIL(1ST IF)		
L8			L34-1185-05	COIL(2.5T)		
L10			L40-3382-19	SMALL FIXED INDUCTOR(0.33UH)		
L11			L34-1239-05	COIL(10.5T)		
L12			L34-0894-05	COIL(5T)		
L13			L34-0742-05	COIL(6T)		
L14			L34-0908-05	COIL(9.5T)		
L15 -17			L34-0499-05	COIL(4T)		
L19			L40-8272-48	SMALL FIXED INDUCTOR(82NH)		
L20			L40-1001-19	SMALL FIXED INDUCTOR(10UH)		
X1			L77-1405-05	CRYSTAL RESONATOR(12.8MHZ)		
X2			L77-1473-05	CRYSTAL RESONATOR(10.245MHZ)		
XF1			L71-0228-15	CRYSTAL FILTER(10.7MHZ)		
W			N67-3008-46	SCREW(MODULE)		
N			N87-2606-46	BRAZIER HEAD TAPTITE SCREW(ANT		
U			N88-2606-46	FLAT HEAD TAPTITE SCREW		
R4			RK73PB2A103J	CHIP R 10K J 1/10W		
R5			RK73PB2A333J	CHIP R 33K J 1/10W		
R6			RK73PB2A274J	CHIP R 270K J 1/10W		
R7			RK73PB2A101J	CHIP R 100 J 1/10W		
R8			RK73PB2A103J	CHIP R 10K J 1/10W		

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PARTS LIST

× New Parts

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Teile ohne Parts No. werden nicht geliefert.

144M TX-RX UNIT (X57-3580-12)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
R9			RK73FB2A101J	CHIP R 100 J 1/10W		
R10 -12			RK73FB2A103J	CHIP R 10K J 1/10W		
R13			RK73FB2A473J	CHIP R 47K J 1/10W		
R14			RK73FB2A104J	CHIP R 100K J 1/10W		
R15			RK73FB2A683J	CHIP R 68K J 1/10W		
R16			RK73FB2A823J	CHIP R 82K J 1/10W		
R17			R92-0670-05	CHIP R 0 ΩHM		
R18			RK73FB2A470J	CHIP R 47 J 1/10W		
R19			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R20			RK73FB2A152J	CHIP R 1.5K J 1/10W		
R21			RK73FB2A471J	CHIP R 470 J 1/10W		
R22			RK73FB2A101J	CHIP R 100 J 1/10W		
R23			RK73FB2A103J	CHIP R 10K J 1/10W		
R24			RK73FB2A473J	CHIP R 47K J 1/10W		
R25			RK73FB2A103J	CHIP R 10K J 1/10W		
R30			R92-0670-05	CHIP R 0 ΩHM		
R31			RK73FB2A394J	CHIP R 390K J 1/10W		
R33 ,34			R92-0670-05	CHIP R 0 ΩHM		
R35			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R36			RK73FB2A101J	CHIP R 100 J 1/10W		
R37			R92-0670-05	CHIP R 0 ΩHM		
R38			RK73FB2A182J	CHIP R 1.8K J 1/10W		
R39 -41			RK73FB2A103J	CHIP R 10K J 1/10W		
R42			RK73FB2A182J	CHIP R 1.8K J 1/10W		
R43			RK73FB2A223J	CHIP R 22K J 1/10W		
R44			RK73FB2A273J	CHIP R 27K J 1/10W		
R45			RK73FB2A473J	CHIP R 47K J 1/10W		
R46			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R47			R92-0670-05	CHIP R 0 ΩHM		
R49			RK73FB2A223J	CHIP R 22K J 1/10W		
R50			RK73FB2A124J	CHIP R 120K J 1/10W		
R52 -54			RK73FB2A473J	CHIP R 47K J 1/10W		
R55			RK73FB2A471J	CHIP R 470 J 1/10W		
R56			RK73FB2A104J	CHIP R 100K J 1/10W		
R57			RK73FB2A105J	CHIP R 1.0M J 1/10W		
R58			RK73FB2A473J	CHIP R 47K J 1/10W		
R59			R92-0670-05	CHIP R 0 ΩHM		
R60			RK73FB2A103J	CHIP R 10K J 1/10W		
R61			RK73FB2A471J	CHIP R 470 J 1/10W		
R62			R92-0670-05	CHIP R 0 ΩHM		
R63 ,64			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R65 ,66			R92-0670-05	CHIP R 0 ΩHM		
R67			RK73FB2A122J	CHIP R 1.2K J 1/10W		
R68			RK73FB2A220J	CHIP R 22 J 1/10W		
R69			RK73FB2A470J	CHIP R 47 J 1/10W		
R71			R92-0670-05	CHIP R 0 ΩHM		
R73			RK73FB2A104J	CHIP R 100K J 1/10W		
R74			R92-0670-05	CHIP R 0 ΩHM		
R75			RK73FB2A103J	CHIP R 10K J 1/10W		
R76			R92-0670-05	CHIP R 0 ΩHM		
R78			R92-1213-05	CHIP R 100 J 1/2W		
R79 ,80			RK73FB2A223J	CHIP R 22K J 1/10W		
R81			RK73FB2A471J	CHIP R 470 J 1/10W		
R82			R92-0685-05	CHIP R 22 J 1/2W		
R83			R92-0670-05	CHIP R 0 ΩHM		

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PARTS LIST

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144M TX-RX UNIT (X57-3580-12)

220M TX-RX UNIT (X57-3810-10)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
R89			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R90			RK73FB2A221J	CHIP R 220 J 1/10W		
R91			RK73FB2A473J	CHIP R 47K J 1/10W		
R92			R92-0679-05	CHIP R 0 00HM		
R93			RK73FB2A104J	CHIP R 100K J 1/10W		
R98 ,99			RK73FB2A103J	CHIP R 10K J 1/10W		
R101			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R102			RK73FB2A472J	CHIP R 4.7K J 1/10W		
VR1			R12-6429-05	TRIM POT. 100K		
VR2			R12-6427-05	TRIM POT. 47K		
VR3 ,4			R12-6423-05	TRIM POT. 10K		
TS1			S79-0401-05	THERMAL SWITCH(95°C)		
D1 -4			1SV164	DIODE		
D5			1SV166	DIODE		
D6			1SV164	DIODE		
D7			1SV166	DIODE		
D11			1SS184	DIODE		
D13			DAN235K	DIODE		
D14			1SS181	DIODE		
D15			M1407	DIODE		
D16			M1308	DIODE		
D17 ,18			MA716	DIODE		
D19			DSA3A1	DIODE		
IC1			BU4094BF	IC(SHIFT/STORE REGISTER)		
IC1			XRU4094BF	IC(8 STAGE SHIFT REGISTER)		
IC2			LA5010M	IC(LOW SATURATION REGULATOR)		
IC5			KCD04	IC(CM IF)		
IC6			KCD05	IC(CM IF)		
IC7			KCA04	IC(MIC AMPLIFIER)		
IC8			KCB11	IC(DRIVER)		
IC9			KCC04	IC(APC)		
IC10			S-AV17	IC(POWER MODULE FOR 144MHZ)		
IC11			KCH05	IC(144MHZ VCO PLL)		
Q1			3SK184(S)	FET		
Q2			3SK131(L)	FET		
Q3			2SC2714(Y)	TRANSISTOR		
Q4			DTA114YK	DIGITAL TRANSISTOR		
Q5 ,6			DTC123JK	DIGITAL TRANSISTOR		
Q7			DTC143EK	DIGITAL TRANSISTOR		
Q10			2SA1362(Y)	TRANSISTOR		
Q11			2SB1119(S)	TRANSISTOR		
Q12			DTC144WK	DIGITAL TRANSISTOR		
Q13 ,14			2SC2712(Y)	TRANSISTOR		
Q15 -17			DTC144EK	DIGITAL TRANSISTOR		
Q18			2SD1757K	TRANSISTOR		
Q19			2SK208(Y)	FET		
Q20			2SC2714(Y)	TRANSISTOR		
Q21			2SC2712(Y)	TRANSISTOR		
Q22			FMG1	TRANSISTOR		
Q23			2SD1902R	TRANSISTOR		
Q24			2SJ106(GR)	FET		
220M TX-RX UNIT (X57-3810-10)						
200	2G		A10-1316-11	CHASSIS		

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220M TX-RX UNIT (X57-3810-10)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
201	3G		B42-2437-04	LABEL(S/NØ)		
C5			CC73FCH1H030C	CHIP C 3PF C		
C7 -9			CK73FB1H102K	CHIP C 1000PF K		
C10			CK73FB1E103K	CHIP C 0.01UF K		
C11			CC73FCH1H010C	CHIP C 1.0PF C		
C12			CC73FCH1H560J	CHIP C 56PF J		
C14			CC73FCH1H0R5C	CHIP C 0.5PF C		
C15			CC73FCH1H120J	CHIP C 12PF J		
C17			CC73FCH1H120J	CHIP C 120PF C		
C18			CK73FB1H102K	CHIP C 1000PF K		
C19			CC73FCH1H060D	CHIP C 6PF D		
C20			CK73FB1H102K	CHIP C 1000PF K		
C21			CC73FCH1H060D	CHIP C 6PF D		
C22			CK73FB1E103K	CHIP C 0.01UF K		
C24			CK73FB1E103K	CHIP C 0.01UF K		
C25			CC45SL2H030C	CERAMIC 3PF C		
C26			CK73FB1H102K	CHIP C 1000PF K		
C29			CK73FB1E103K	CHIP C 0.01UF K		
C30			CC73FCH1H150J	CHIP C 15PF J		
C31			CC73FCH1H101J	CHIP C 100PF J		
C33			CK73FB1E104K	CHIP C 0.10UF K		
C34 ,35			CK73EF1C105Z	CHIP C 1.0UF Z		
C36 ,37			CK73FB1E103K	CHIP C 0.01UF K		
C44 ,45			CE04NW1C470M	ELECTRØ 47UF 16WV		
C46			C92-0504-05	CHIP TAN 0.68UF 20WV		
C47			CE04NW1C470M	ELECTRØ 47UF 16WV		
C48			C92-0003-05	CHIP TAN 0.47UF 25WV		
C50			CE04NW1C470M	ELECTRØ 47UF 16WV		
C51 ,52			CK73FB1E103K	CHIP C 0.01UF K		
C53 ,54			CK73FB1H102K	CHIP C 1000PF K		
C55			CK73EF1C105Z	CHIP C 1.0UF Z		
C56			CC73FUJ1H150J	CHIP C 15PF J		
C57			CK73FB1H102K	CHIP C 1000PF K		
C58			CC73FUJ1H200J	CHIP C 20PF J		
C59 ,60			CK73FB1H102K	CHIP C 1000PF K		
C61			CE04NW1C470M	ELECTRØ 47UF 16WV		
C62			CK73FB1H102K	CHIP C 1000PF K		
C63			CK73FB1E103K	CHIP C 0.01UF K		
C64			CE04NW1E100M	ELECTRØ 10UF 25WV		
C65			CE04NW1A330M	ELECTRØ 33UF 10WV		
C66			CK73FB1E103K	CHIP C 0.01UF K		
C67			CK73FB1H102K	CHIP C 1000PF K		
C68			CC73FCH1H100D	CHIP C 10PF D		
C69			CC73FCH1H100D	CHIP C 10PF D		
C70			CK73FB1E103K	CHIP C 0.01UF K		
C71 -73			CK73FB1H102K	CHIP C 1000PF K		
C74			CK73FB1H223K	CHIP C 0.022UF K		
C75			CE04NW1C101M	ELECTRØ 100UF 16WV		
C76			CK73EF1C105Z	CHIP C 1.0UF Z		
C77 ,78			CK73FB1H102K	CHIP C 1000PF K		
C79			CK73EF1C105Z	CHIP C 1.0UF Z		
C81			CC45SL2H180J	CERAMIC 18PF J		
C82			CK73FB1H102K	CHIP C 1000PF K		
C83			CK45B2H102K	CERAMIC 1000PF K		

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PARTS LIST

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220M TX-RX UNIT (X57-3810-10)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
C84			CC45SL2H040C	CERAMIC 4.0PF J		
C85			CC73FCH1H050C	CHIP C 5PF C		
C86			CC73FCH1H0R5C	CHIP C 0.5PF C		
C87			CC73FCH1H020C	CHIP C 2.0PF C		
C88			CC45SL2H220J	CERAMIC 22PF J		
C89			CC45SL2H180J	CERAMIC 18PF J		
C90 -92			CK73FB1H102K	CHIP C 1000PF K		
C93			CC73FCH1H0R5C	CHIP C 0.5PF C		
C94			CM73F2H050D	CHIP C 5.0PF D		
C95			CC73FCH1H020C	CHIP C 2.0PF C		
C96			CK73FB1E103K	CHIP C 0.01UF K		
C97			CC73FCH1H150J	CHIP C 15PF J		
C98			CK73FB1H102K	CHIP C 1000PF K		
C99			CE04NW1E100M	ELECTR0 10UF 25WV		
C100			CC73FCH1H010C	CHIP C 1PF C		
C101			CE04NW1E100M	ELECTR0 10UF 25WV		
C102			CC73FCH1H470J	CHIP C 47PF J		
C103			CK73FB1H102K	CHIP C 1000PF K		
C104			CK73FB1E103K	CHIP C 0.01UF K		
C105			CK73FB1H223K	CHIP C 0.022UF K		
C106			CC73FCH1H470J	CHIP C 47PF J		
C108			CC73FCH1H390J	CHIP C 39PF J		
C109, 110			CK73FB1H102K	CHIP C 1000PF K		
C111			CK73FB1E103K	CHIP C 0.01UF K		
C112			CE04NW1A221M	ELECTR0 220UF 10WV		
C113			CC73FCH1H080D	CHIP C 8PF D		
C114, 115			CC73PSL1H101J	CHIP C 100PF J		
C116			CC73FCH1H060D	CHIP C 6PF D		
C119			CE04NW1E100M	ELECTR0 10UF 25WV		
C120-127			CC73PSL1H101J	CHIP C 100PF J		
C128, 129			CK73FB1H102K	CHIP C 1000PF K		
C130			CE04EW1C102M	ELECTR0 1000UF 16WV		
C131			CC73FCH1H070D	CHIP C 7PF D		
C133			CC73FCH1H100D	CHIP C 10PF D		
C134			CK73FB1E103K	CHIP C 0.01UF K		
C135-137			CK73FB1H102K	CHIP C 1000PF K		
C140			CC73FCH1H010C	CHIP C 1PF C		
TC1			C05-0371-05	TRIMMING CAP 10PF		
203			E30-3009-15	ANT CABLE		
-	3H		E72-0406-04	TERMINAL BOARD(+)		
CN1 , 2			E40-5461-05	PIN ASSY(12P)		
J1			E11-0442-05	PHONE JACK(3P)		
J2			E23-0619-05	TERMINAL(TP)		
205	2G		F10-1446-04	SHIELDING PLATE		
204	1G		F10-2010-03	SHIELDING COVER		
-			F10-2012-04	SHIELDING CASE(VCO-PLL)		
-			F20-1008-04	INSULATION SHEET(APC)		
209	3G		G02-0600-14	FLAT SPRING(THERMAL SW)		
-			G02-0705-04	FLAT SPRING		
210			G02-0715-04	LEAF SPRING(APC TR)		
-			G02-0718-04	FLAT SPRING(VCO)		
211	3G		G11-0655-04	SHEET(CN1,2 55X8)		A
212	1G		G11-0656-24	CONDUCTIVE RUBBER		
-			G11-0661-04	INSULATING SHEET(APV TR)		

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220M TX-RX UNIT (X57-3810-10)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
-			G13-1337-04	CUSHION(VCO)		
-			G13-0841-04	FORMED PLATE(XTAL)		
216	3G		G13-1337-04	CUSHION(VCO)		
213	3G		G13-1349-04	CUSHION(VCO 22X7)		
			G13-1351-04	CUSHION(55X8)		
217	2H		J42-0471-04	DC CORD BUSHING		
CD1			L79-1013-05	FILTER(CDBM455C16)		
CF1			L72-0372-05	CERAMIC FILTER(CFWM455F)		
L1 -4			L34-4279-05	COIL(MC133)		
L5			L40-1082-19	SMALL FIXED INDUCTOR(0.1UH)		
L6			L34-4280-05	COIL(1ST IF)		
L10			L40-1582-19	SMALL FIXED INDUCTOR(0.15UH)		
L11			L34-1239-05	COIL(10.5T)		
L12			L34-1207-05	COIL(3.5T)		
L13			L34-1208-05	COIL(3T)		
L14			L34-0908-05	COIL(9.5T)		
L15 ,16			L34-0641-05	COIL		
L19			L40-8272-48	SMALL FIXED INDUCTOR(82NH)		
L20			L40-1001-19	SMALL FIXED INDUCTOR(10UH)		
L21			L40-1092-19	SMALL FIXED INDUCTOR(1UH)		
L22			L40-3372-48	SMALL FIXED INDUCTOR(33NH)		
X1			L77-1405-05	CRYSTAL RESONATOR(12.8MHZ)		
X2			L77-1463-05	CRYSTAL RESONATOR(30.37MHZ)		
XF1			L71-0420-05	CRYSTAL FILTER(30.825MHZ)		
W			N09-3008-46	SCREW(MODULE)		
N			N87-2606-46	BRAZIER HEAD TAPTITE SCREW(ANT		
U			N88-2606-46	FLAT HEAD TAPTITE SCREW		
R5			RK73FB2A333J	CHIP R 33K J 1/10W		
R6			RK73FB2A104J	CHIP R 100K J 1/10W		
R7			RK73FB2A101J	CHIP R 100 J 1/10W		
R8			RK73FB2A103J	CHIP R 10K J 1/10W		
R9			RK73FB2A101J	CHIP R 100 J 1/10W		
R10 -12			RK73FB2A104J	CHIP R 100K J 1/10W		
R13			RK73FB2A473J	CHIP R 47K J 1/10W		
R14			RK73FB2A103J	CHIP R 10K J 1/10W		
R18			RK73FB2A151J	CHIP R 150 J 1/10W		
R19			R92-0670-05	CHIP R 0 OHM		
R20			RK73FB2A122J	CHIP R 1.2K J 1/10W		
R21			RK73FB2A471J	CHIP R 470 J 1/10W		
R22			RK73FB2A101J	CHIP R 100 J 1/10W		
R23			RK73FB2A103J	CHIP R 10K J 1/10W		
R24			RK73FB2A473J	CHIP R 47K J 1/10W		
R25			RK73FB2A103J	CHIP R 10K J 1/10W		
R31			RK73FB2A394J	CHIP R 390K J 1/10W		
R32			RK73FB2A103J	CHIP R 10K J 1/10W		
R33 ,34			R92-0670-05	CHIP R 0 OHM		
R35			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R36			RK73FB2A101J	CHIP R 100 J 1/10W		
R37			R92-0670-05	CHIP R 0 OHM		
R38			RK73FB2A182J	CHIP R 1.8K J 1/10W		
R39 -41			RK73FB2A103J	CHIP R 10K J 1/10W		
R42			RK73FB2A182J	CHIP R 1.8K J 1/10W		
R43			RK73FB2A223J	CHIP R 22K J 1/10W		

L:Scandinavia

K:USA

P:Canada

Y:PX(Far East, Hawaii)


T:England

E:Europe

Y:AAFES(Europe)

X:Australia

M:Other Areas

 indicates safety critical components.

PARTS LIST

✕ New Parts

Parts without Parts No. are not supplied.

Les articles non mentionnés dans le Parts No. ne sont pas fournis.

Teile ohne Parts No. werden nicht geliefert.

220M TX-RX UNIT (X57-3810-10)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
R44			RK73FB2A273J	CHIP R 27K J 1/10W		
R45			RK73FB2A473J	CHIP R 47K J 1/10W		
R46			RK73FB2A472J	CHIP R 4.7K J 1/10W		
R47			R92-0670-05	CHIP R 0 ΩHM		
R49			RK73FB2A223J	CHIP R 22K J 1/10W		
R50			RK73FB2A124J	CHIP R 120K J 1/10W		
R52 -54			RK73FB2A473J	CHIP R 47K J 1/10W		
R55			RK73FB2A471J	CHIP R 470 J 1/10W		
R56			RK73FB2A104J	CHIP R 100K J 1/10W		
R57			RK73FB2A105J	CHIP R 1.0M J 1/10W		
R59			R92-0670-05	CHIP R 0 ΩHM		
R60			RK73FB2A103J	CHIP R 10K J 1/10W		
R61			RK73FB2A471J	CHIP R 470 J 1/10W		
R62			R92-0670-05	CHIP R 0 ΩHM		
R63 ,64			RK73FB2A222J	CHIP R 2.2K J 1/10W		
R65 ,66			R92-0670-05	CHIP R 0 ΩHM		
R67			RK73FB2A122J	CHIP R 1.2K J 1/10W		
R68			RK73FB2A220J	CHIP R 22 J 1/10W		
R69			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R71			R92-0670-05	CHIP R 0 ΩHM		
R73			RK73FB2A104J	CHIP R 100K J 1/10W		
R74			R92-0670-05	CHIP R 0 ΩHM		
R75			RK73FB2A392J	CHIP R 3.9K J 1/10W		
R76 ,77			R92-0670-05	CHIP R 0 ΩHM		
R78			R92-1213-05	CARBON 100 J 1/2W		
R79 ,80			RK73FB2A223J	CHIP R 22K J 1/10W		
R81			RK73FB2A471J	CHIP R 470 J 1/10W		
R82			R92-0699-05	SOLID 10 1/2W		
R83 -86			R92-0670-05	CHIP R 0 ΩHM		
R89			RK73FB2A332J	CHIP R 3.3K J 1/10W		
R90			RK73FB2A221J	CHIP R 220 J 1/10W		
R91			RK73FB2A473J	CHIP R 47K J 1/10W		
R92 ,93			RK73FB2A104J	CHIP R 100K J 1/10W		
R98			RK73FB2A223J	CHIP R 22K J 1/10W		
R99			RK73FB2A103J	CHIP R 10K J 1/10W		
R100			R92-0670-05	CHIP R 0ΩHM		
R101			RK73FB2A102J	CHIP R 1.0K J 1/10W		
R102			RK73FB2A472J	CHIP R 4.7K J 1/10W		
VR1			R12-6429-05	TRIM POT. 100K		
VR2			R12-6427-05	TRIM POT. 47K		
VR3			R12-6423-05	TRIM POT. 10K		
VR4			R12-6423-05	TRIM POT. 10K		
TS1			S79-0401-05	THERMAL SWITCH(95°C)		
D3			1SV164	DIODE		
D5			1SV164	DIODE		
D7			1SV164	DIODE		
D11			1SS184	DIODE		
D12			1SS184	DIODE		
D13			DAN235(K)	DIODE		
D14			1SS181	DIODE		
D15			MI407	DIODE		
D16			MI308	DIODE		
D17 ,18			1SS226	DIODE		

L:Scandinavia

K:USA

P:Canada

Y:PX(Far East, Hawaii)

T:England

E:Europe

Y:AAFES(Europe)

X:Australia

M:Other Areas

⚠ indicates safety critical components.

PARTS LIST

✕ New Parts

Parts without Parts No. are not supplied.

Les articles non mentionnés dans le Parts No. ne sont pas fournis.

Teile ohne Parts No. werden nicht geliefert.

220M TX-RX UNIT (X57-3810-10)

Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕向	Re- marks 備考
D19 D20 IC1 IC1 IC2			DSA3A1 1SV164 BU4094BF XRU4094BF LA5009M	DIODE DIODE IC(SHIFT/STORE REGISTER) IC(B STAGE SHIFT REGISTER) IC(LOW SATURATION REGULATOR)		
IC5 IC7 IC8 IC9 IC10			KCD04 KCA04 KCB15 KCC04 M57774	IC(FM IF) IC(MIC AMPLIFIER) IC(DRIVER AMP) IC(APC) IC(POWER MODULE FOR 220-225MHZ)		
IC11 Q1 , 2 Q3 Q10 Q11			KCH08 3SK184(S) 2SC2714(Y) 2SA1362(Y) 2SB1119(S)	IC(220MHZ VCO PLL) FET TRANSISTOR TRANSISTOR TRANSISTOR		
Q12 Q13 , 14 Q15 -17 Q18 Q19			DTC144WK 2SC2712(Y) DTC144EK 2SD1757K 2SK208(Y)	DIGITAL TRANSISTOR TRANSISTOR DIGITAL TRANSISTOR TRANSISTOR FET		
Q20 Q21 Q22 Q23 Q24			2SC2714(Y) 2SC2712(Y) FMG1 2SD1902R 2SJ106(GR)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR FET		

L:Scandinavia

K:USA

P:Canada

Y:PX(Far East, Hawaii)


T:England

E:Europe

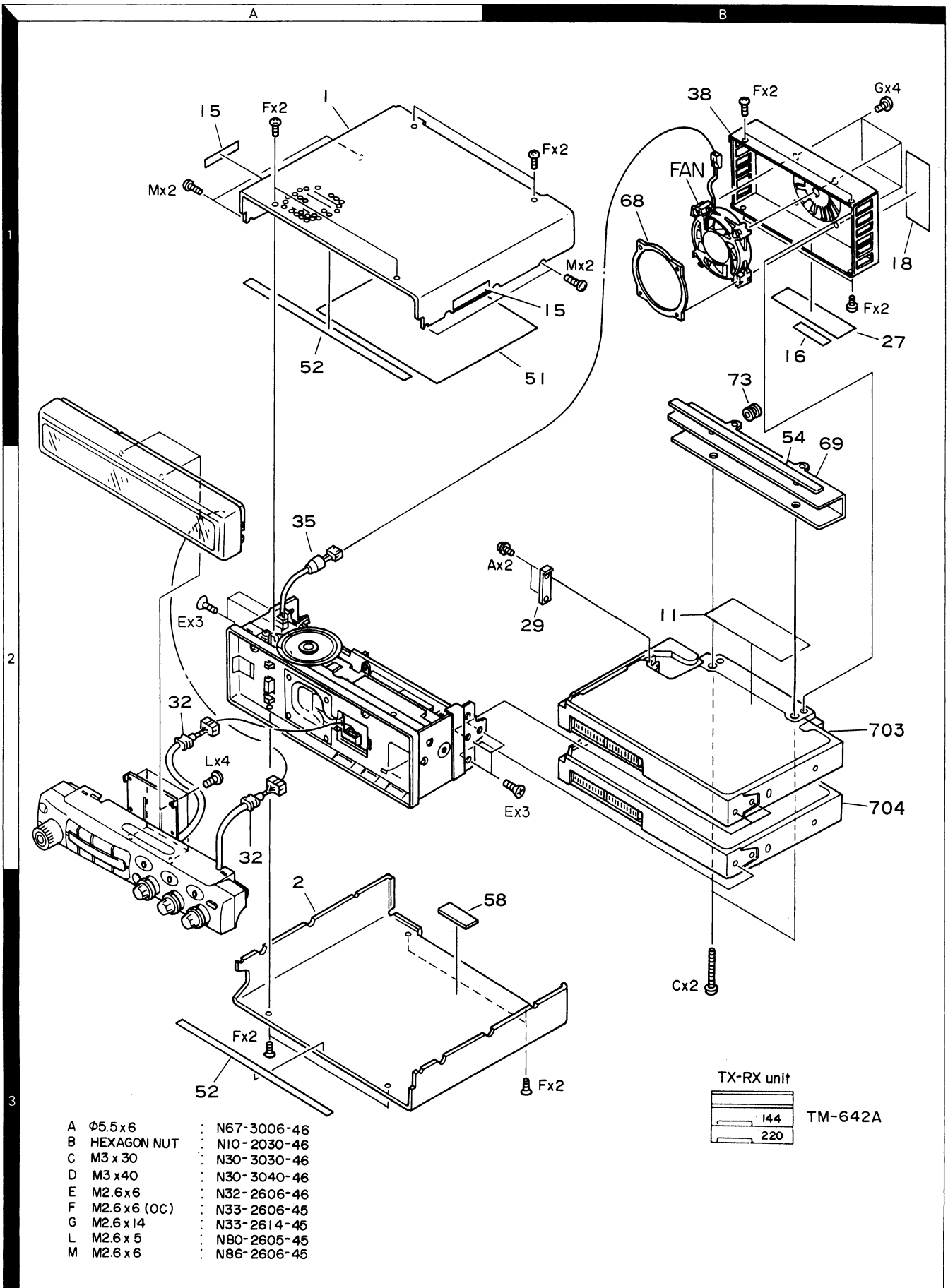
Y:AAFES(Europe)

X:Australia

M:Other Areas

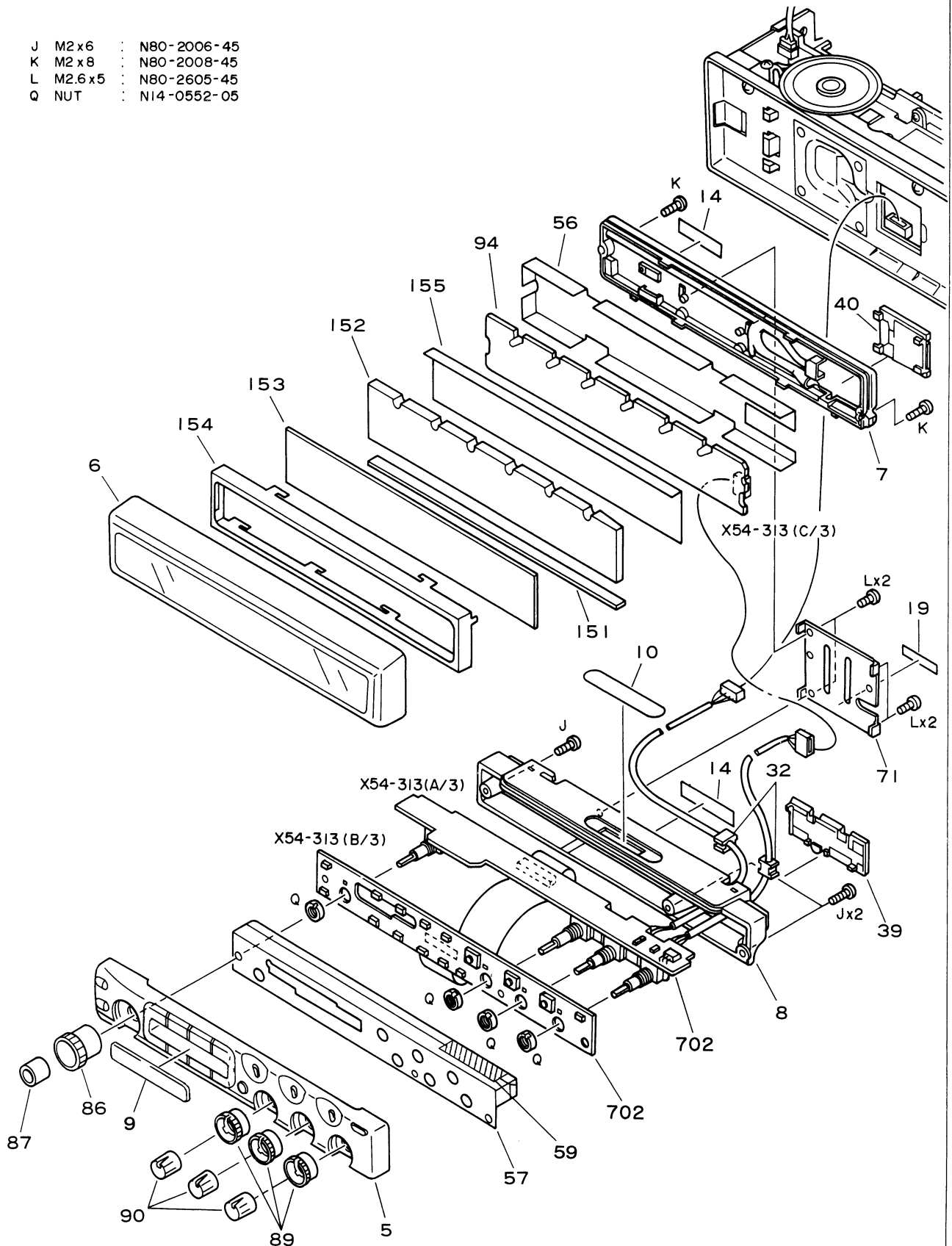
 indicates safety critical components.

EXPLODED VIEW

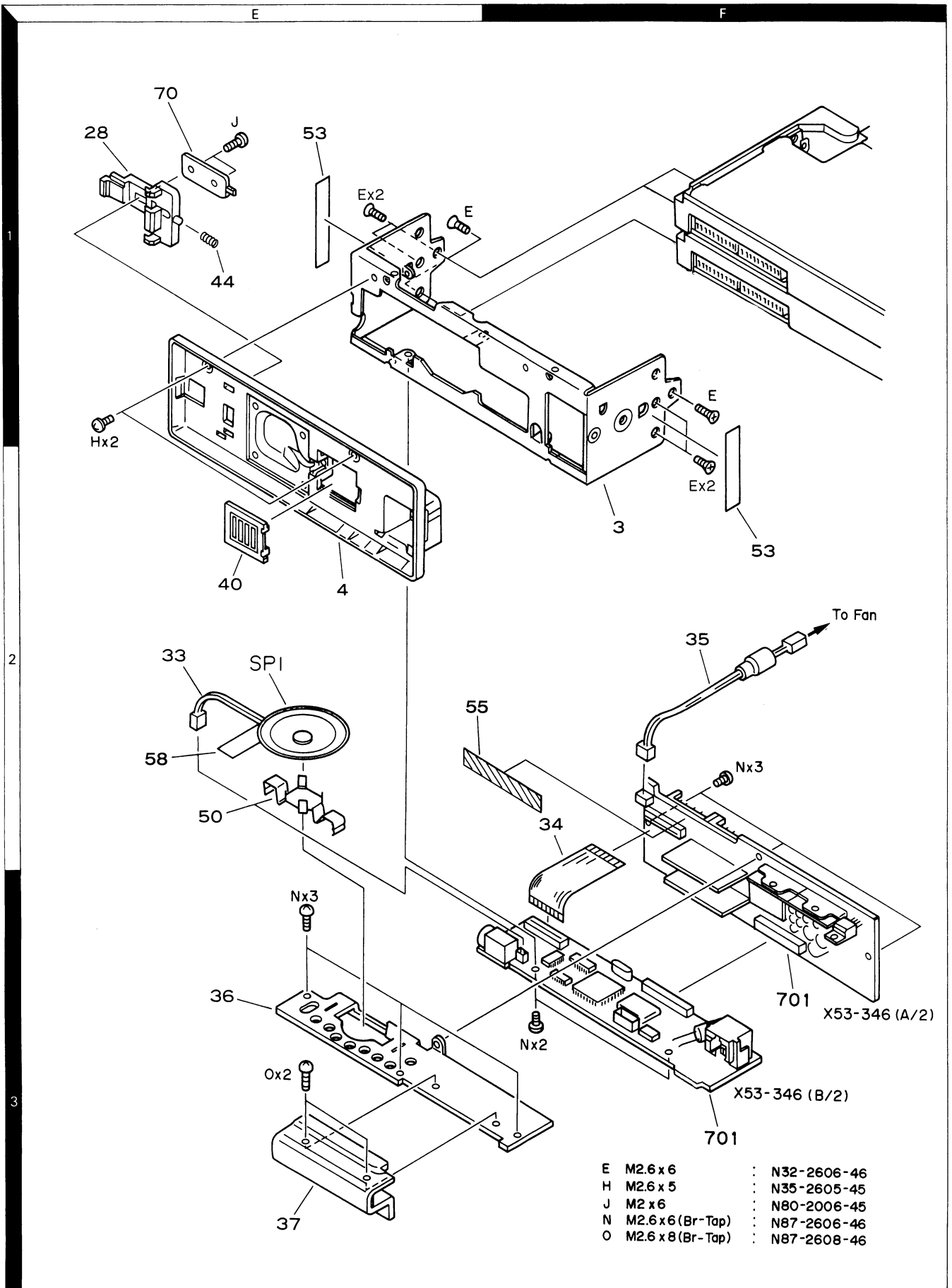


EXPLODED VIEW

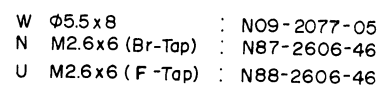
J	M2 x 6	:	N80-2006-45
K	M2 x 8	:	N80-2008-45
L	M2.6 x 5	:	N80-2605-45
Q	NUT	:	NI4-0552-05



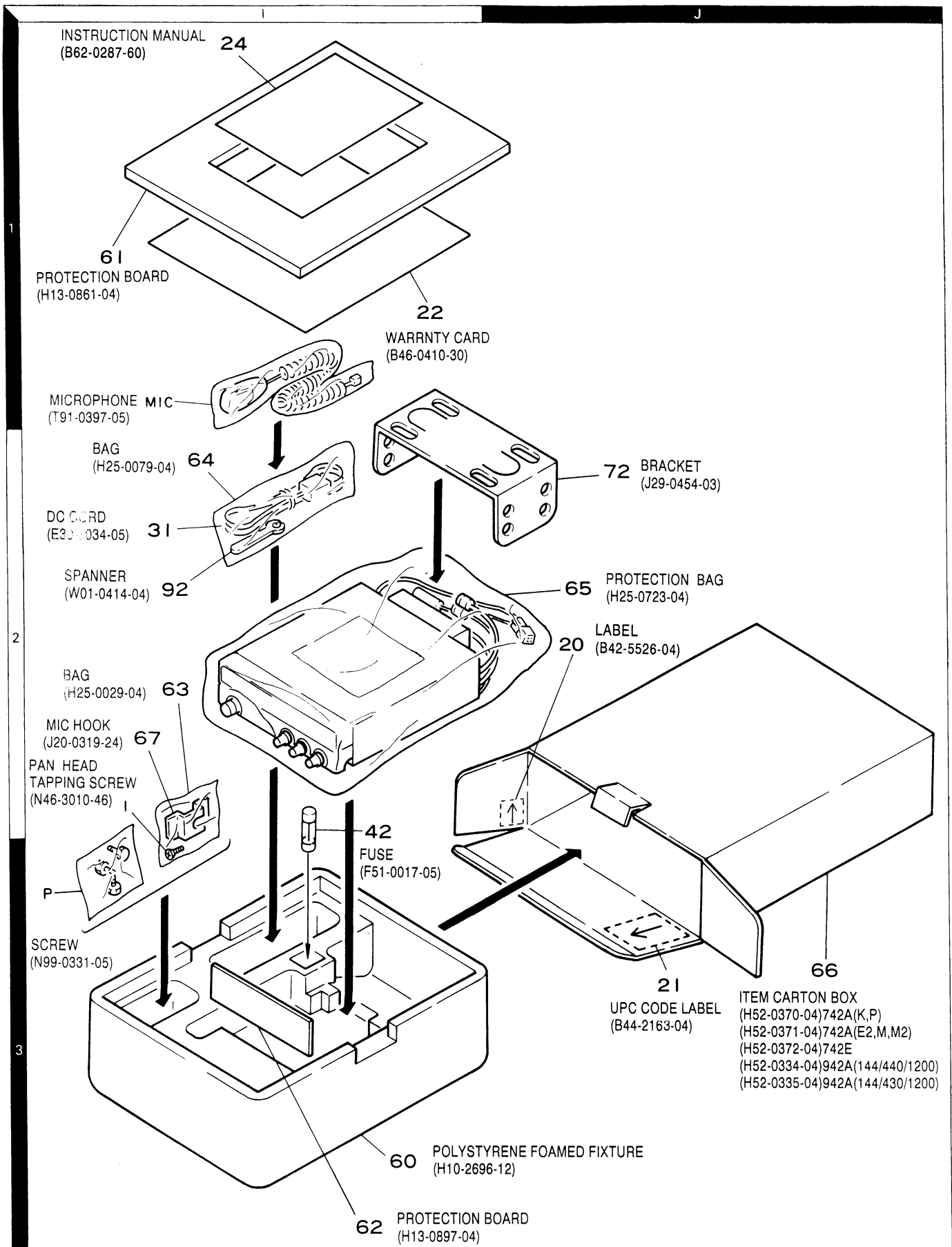
EXPLODED VIEW



TX-RX UNIT



PACKING



Parts with the exploded numbers larger than 700 are not supplied.

ADJUSTMENT

Required Test Equipment

- 1. Tester and DC V.M
Use a tester with high input impedance.
- 2. RF VTVM (RF VM)
Input impedance: 1 M ohms or more, 2 pF or less
Voltage range: FS = 10 mV to 300 V
Measurable frequency: 1,300 MHz (maximum)
- 3. Frequency counter (F counter)
Input sensitivity: Approximately 50 mV
Measurable frequency: 1,300 MHz or more
- 4. DC power supply
Voltage: 10 to 17 V (variable)
Current: 12 A or more
- 5. Power meter
Power measurement ranges: 100 W, 50 W, and 15 W
Input impedance: 50 ohms
Measurable frequency: 1,300 HMz
- 6. AF vacuum voltmeter (AF VM)
Input impedance: 1 M ohms or more
Voltage range: FS= 1 mV to 30 V
Measurable frequency: 50 Hz to 10 kHz
- 7. AF generator (AG)
Output frequency: 100 Hz to 10 kHz
Output voltage: 0.5 mV to 1 V
- 8. Linear detector
Measurable frequency: 1,300 MHz
- 9. Spectrum analyzer
Measurable frequency: 1,300 MHz
- 10. Directional coupler
- 11. Oscilloscope
Use a high-sensitivity oscilloscope with horizontal input socket.
- 12. SSG
Use an SSG that produces a frequency of 20 to 1,300 MHz with amplitude and frequency modulation.
Output level: 0.1µV to 100 mV
- 13. Dummy resistor
Use an 8-ohm resistor exceeding the rated value in each band.

- 14. Noise generator
Use a noise generator whose output contains a high-frequency component of more than 1,300 MHz (near ignition noise).
- 15. Sweep generator
Use a sweep generator that can sweep the 1,300 MHz band.
- 16. Tracking generator

Preparation

- Set controls to the position shown in Table 22 unless otherwise specified.

POWER SW	OFF
AF VOL VR	MIN
SQL VOL VR	MIN

Table 22

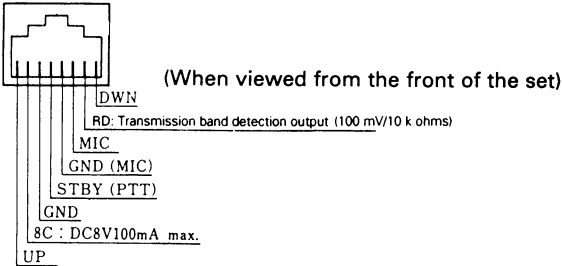


Fig. 58 Microphone Socket (on Front Panel)

- Use an insulated tool such as a plastic tool during adjustment (especially trimmer coil adjustment).
- For SSG protection, do not connect a microphone to the microphone socket during receiver block adjustment.
- Check that the power switch is off before the power cord is connected.
- The SSG output level is displayed at the release end.
- After setting the various controls as shown in Table 22, make sure that the indications of the display and the LEDs are as shown in Figure 59 when the POWER switch is turned ON while pushing the MR key.

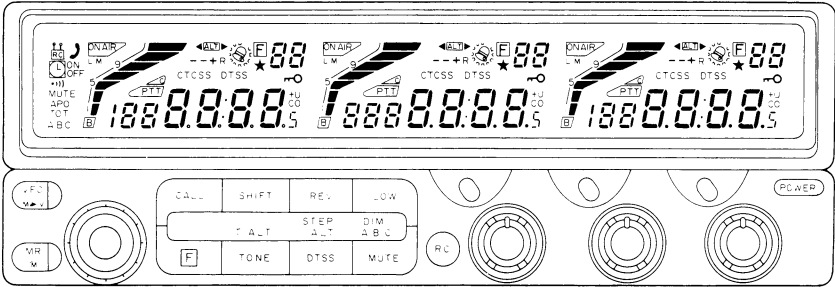


Fig. 59

ADJUSTMENT

• 144 MHz Band

Common Section Adjustment

Item	Condition	Measurement point			Adjustment point			Specification
		Test equipment	Unit	Terminal	Unit	Parts	Method	
1. Lock voltage check	1. Frequency: 144.040MHz Receive	Digital voltmeter	TX-RX	TP2			Check the lock voltage.	1.6 ~ 3.0 V

The DC power supply must be set to the rated voltage.

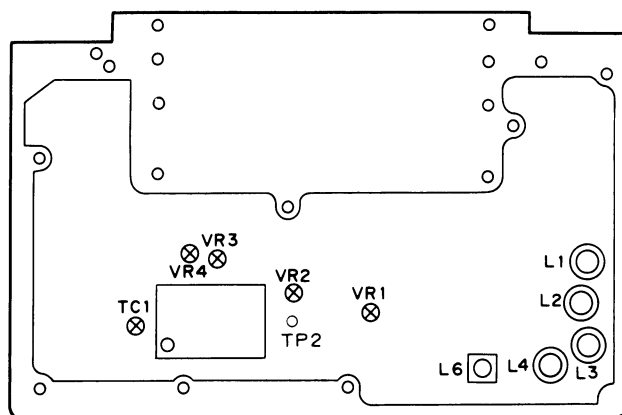
Receiver Section Adjustment

Item	Condition	Measurement point			Adjustment point			Specification
		Test equipment	Unit	Terminal	Unit	Parts	Method	
1. Bandpass filter (BPF) adjustment	1. Frequency: 144.040MHz SSG output: -113dBm/0.5μV Modulation: 1 KHz Deviation: 3 KHz Receive	Digital voltmeter SSG			TX-RX	L1-4	Adjust so that the voltmeter reading is maximum.	Voltmeter reading is maximum.
2. Receive sensitivity check	1. Frequency: 144.050 MHz 146.050 MHz 147.950 MHz SSG output: -122dBm/0.18μV Modulation: 1 KHz Deviation: 3 KHz	Distortion meter Millivoltmeter Oscilloscope SSG	Rear panel	EXT.SP			Check	12 dB SINAD or more
	2. AM sensitivity (K and P models only) Frequency: 118.050MHz SSG output: -73dBm/50μV Modulation: 1 KHz Deviation: 30%						Press the MHz key and check that the frequency is set to 118.050 with an encoder.	12 dB SINAD or more
	Press the MR key							
3. Distortion factor adjustment	1. Frequency: 145.040 MHz SSG output: -73dBm/50μV Modulation: 1 KHz Deviation: 3 KHz AF output: 4V/8 ohms	Distortion factor Oscilloscope SSG	Rear panel	EXT.SP	TX-RX	L6	Minimize the distortion factor.	5% or less
4. Signal strength meter adjustment	1. Frequency: 145.040 MHz SSG output: -91dBm/6.3μV Modulation: 1 KHz Deviation: 3 KHz	SSG			TX-RX	VR1	Adjust so that all LEDs go on, then one LED goes off.	
	2 SSG output: -90dBm/7.1μV MOD: 1 kHz DEV: 3 kHz						Adjust the SSG output so that all signal strength meter LEDs go on.	The SSG output is 20 ± 6 dBμ
5. Squelch check	1. Frequency: 146.040 MHz SSG output: Off Modulation: 1 KHz Deviation: 3 KHz	SSG	Rear panel	EXT.SP			Set the SQL control to the closing position	Control position 8:00-11:00 BUSY should go out
	2 SSG output: -127dBm/0.1μV MOD: 1 kHz DEV: 3 kHz							Squelch should open, and BUSY should light up
							SQL control fully clockwise	Noise should disappear
	3. SSG output: -116dBm/0.36μV							Squelch should open

ADJUSTMENT

Transmitter Section Adjustment

Item	Condition	Measurement point			Adjustment point			Specification
		Test equipment	Unit	Terminal	Unit	Parts	Method	
1. Power adjustment (check)	1. Maximum power check Frequency: 136.000 MHz 145.980 MHz 147.980 MHz Transmit	Powermeter Ammeter	Rear Panel	ANT	TX-RX	VR3	Check	48 W or more
	2. High-power adjustment Transmit				TX-RX	VR3	Adjust: 48W	47.5 to 48.5 W (11.5 A or less)
	3. Medium-power adjustment Transmit				TX-RX	VR4	Adjust: 12W	10 to 14 W
	4. Low-power check Transmit						Check	3 to 8 W
2. Deviation adjustment (check)	1. Frequency: 145.980 MHz AG: 1 kHz, 50 mV Filter: 25 15K Transmit	DC detector Oscilloscope	Rear Panel	ANT	TX-RX	VR2	Adjust (in the higher + or - direction). 4.2 KHz	± 4.0 to 5.0 KHz
	2. Frequency: 145.980 MHz AG: 1 KHz, 5.0 mV Transmit						Check	± 2.2 to 3.6 kHz
3. Tone check	1. Frequency: 144.980 MHz Tone On Transmit	DC detector Oscilloscope	Rear Panel	ANT			Check	± 0.5 to 1.5 KHz
4. Protection check	1. Frequency: 147.980 MHz Antenna: open Transmit	Ammeter					Check	12.0 A or less
5. Frequency adjustment	1. Frequency: 145.980 MHz Transmit	Frequency counter Powermeter			TX-RX	TC1	145.980 MHz	± 100 Hz



Note: Use an adjustment tool with a ceramic or plastic tip 1.5 mm square for L1 through L4.

Fig. 57 144 MHz band adjustment: Component layout (upper view)

ADJUSTMENT

● 220 MHz Band

Common Section Adjustment

Item	Condition	Measurement point			Adjustment point			Specification
		Test equipment	Unit	Terminal	Unit	Parts	Method	
1. Lock voltage check	1. Frequency: 215.000 MHz Receive	Digital voltmeter	TX-RX	TP2			Check the lock voltage	1.2 ~ 2.6V

Receiver Section Adjustment

Item	Condition	Measurement point			Adjustment point			Specification
		Test equipment	Unit	Terminal	Unit	Parts	Method	
1. Bandpass filter (BPF) adjustment	1. Frequency: 222.540 MHz SSG output: $-113\text{dBm}/0.5\mu\text{V}$ Modulation: 1KHz Deviation: 3KHz Receive	Digital voltmeter SSG	Rear Panel	ANT.	TX-RX	L1~4	Voltmeter reading is maximum.	Voltmeter reading is maximum.
2. Distortion factor adjustment	1. Frequency: 222.540 MHz SSG output: $-103\text{dBm}/1.58\mu\text{V}$ Modulation: 1KHz Deviation: 3KHz	Distortion meter Oscilloscope SSG	Rear Panel	EXT. SP	TX-RX	L6	Minimize the distortion factor	5% or less
3. Receive sensitivity check	1. Frequency: 222.540 MHz SSG output: $-121\text{dBm}/0.2\mu\text{V}$ Modulation: 1KHz Deviation: 3KHz	Distortion meter Millivoltmeter Oscilloscope SSG	Rear Panel	EXT. SP			Check	12dB SINAND or more
	2. Frequency: 215.040 MHz SSG output: $-121\text{dBm}/0.2\mu\text{V}$ Modulation: 1KHz Deviation: 3KHz		Rear panel	EXT. SP			Check	12dB SINAND or more
	3. Frequency: 229.980 MHz SSG output: $-121\text{dBm}/0.2\mu\text{V}$ Modulation: 1KHz Deviation: 3KHz		Rear panel	EXT. SP			Check	12dB SINAND or more
4. Signal strength meter adjustment	1. Frequency: 222.540 MHz SSG output: $-92\text{dBm}/5.6\mu\text{V}$ Modulation: 1KHz Deviation: 3KHz	SSG			TX-RX	VR1	Adjust so that all LEDs go on, then one LED goes off.	
5. Signal strength meter check	2. Frequency: 222.540 MHz SSG output: $-91\text{dBm}/6.3\mu\text{V}$ Modulation: 1KHz Deviation: 3KHz						Adjust the SSG output so that all signal strength meter LEDs go on.	The SSG output is $20 \pm 6\text{ dB}\mu$
6. Squelch check	1. Frequency: 222.540 MHz SSG output: OFF	SSG	Rear Panel	EXT. SP			Set the SQL control to the closing position	Control position 8:00-11:00 BUSY should go out
	2. Frequency: 222.540 MHz SSG output: $-127\text{dBm}/0.1\mu\text{V}$ Modulation: 1KHz Deviation: 3KHz							Squelch should open, and BUSY should
	3. SSG output: $-116\text{dBm}/0.36\mu\text{V}$						SQL control fully clockwise	Noise should disappear Squelch should open

ADJUSTMENT

Transmitter Section Adjustment

Item	Condition	Measurement point			Adjustment point			Specification
		Test equipment	Unit	Terminal	Unit	Parts	Method	
1. Maximum power check	1. Frequency: 222.500 MHz Transmit	Powermeter Ammeter	Rear Panel	ANT	TX-RX	VR3	Check	28W or more (reference)
2. High-power adjustment (check)	1. Frequency: 222.500 MHz Transmit				TX-RX	VR3	Adjust	26W
	2. Frequency: 222.000 MHz Transmit						Check	22W or more
	3. Frequency: 224.980 MHz Transmit						Check	22W or more
3. Medium-power adjustment (check)	1. Frequency: 222.540 MHz Transmit	Powermeter	Rear Panel	ANT	TX-RX	VR4	Adjust	11W
	2. Frequency: 222.000 MHz Transmit						Check	9W or more
	3. Frequency: 224.980 MHz Transmit						Check	9W or more
4. Low-power check	1. Frequency: 222.540 MHz Transmit	Powermeter	Rear Panel	ANT			Check	3.0 ~ 8.0W
	2. Frequency: 220.000 MHz Transmit						Check	3.0 ~ 8.0W
	3. Frequency: 222.980 MHz Transmit						Check	3.0 ~ 8.0W
5. Deviation adjustment (check)	1. Frequency: 222.500 MHz AG: 1 kHz, 50 mV Filter: 25 15K Transmit	DC detector Oscilloscope AG	Rear Panel	ANT	TX-RX	VR2	Adjust 4.4 KHz	$\pm 4.4\text{KHz} \pm 200\text{ Hz}$
	2. Frequency: 222.500 MHz AG: 1 kHz, 5.0 mV Filter: 25 15K Transmit						Check	± 2.2 to 3.6 KHz
6. Frequency adjustment	1. Frequency: 222.500 MHz Transmit	Frequency counter Powermeter	Rear Panel	ANT	TX-RX	TC1	Adjust	222.500 MHz \pm 2KHz
7. Protection check	1. Frequency: 224.980 MHz Antenna: Open Transmit	Ammeter					Check	7.5A or less

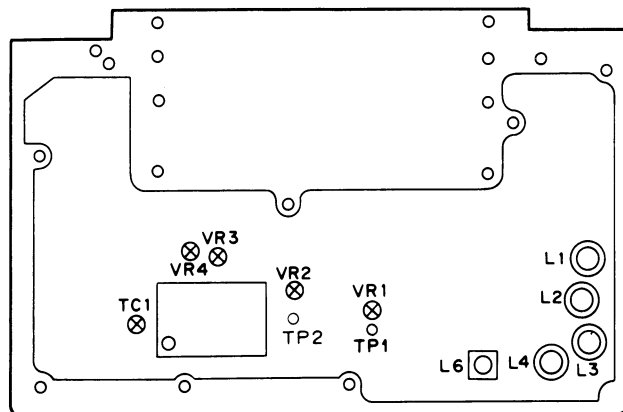
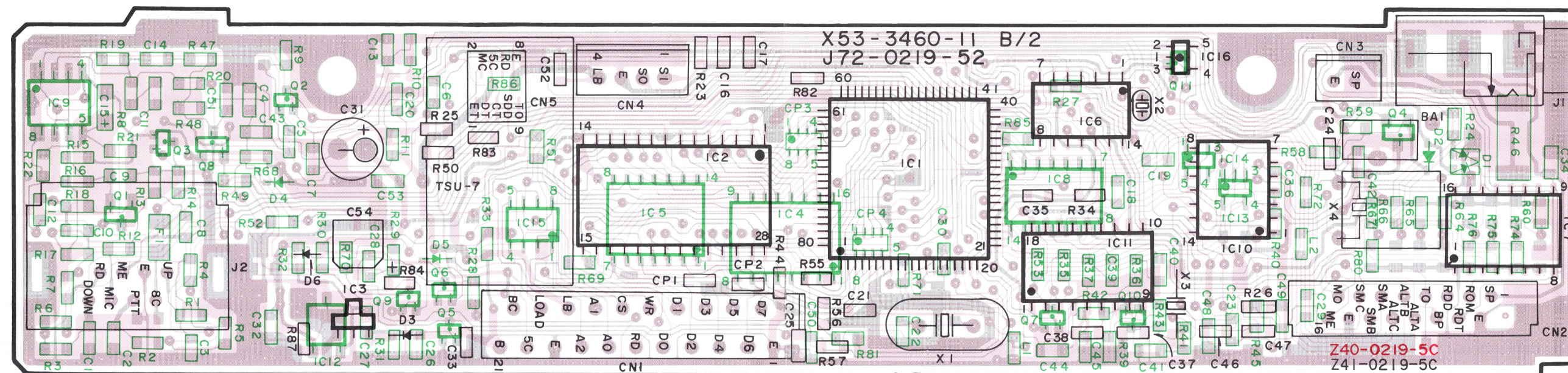
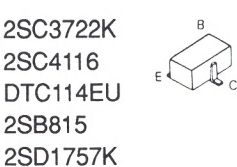
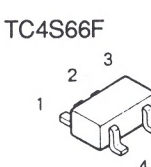
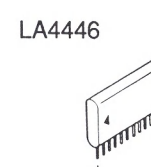
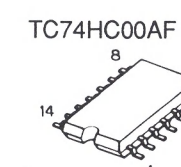
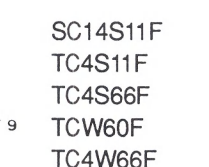
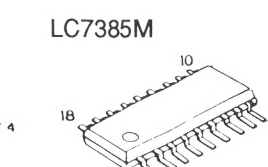
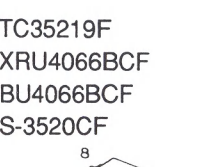
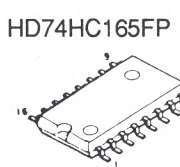
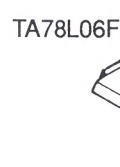
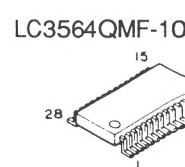
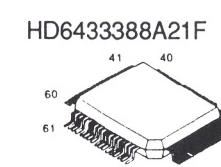
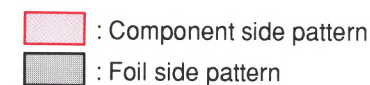
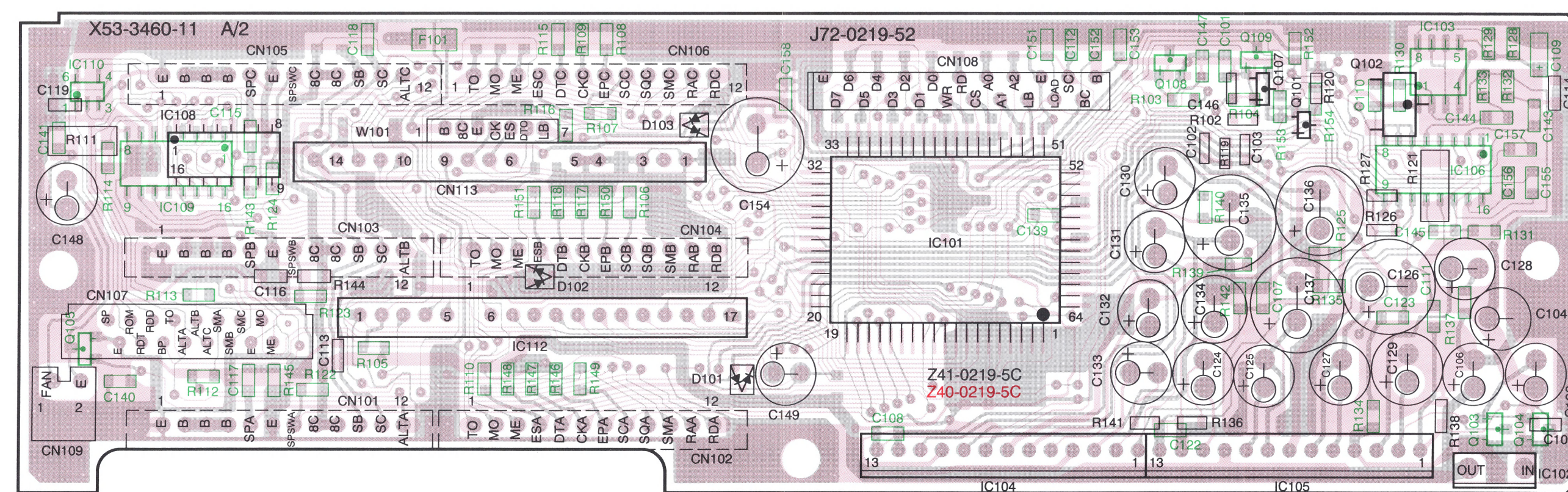
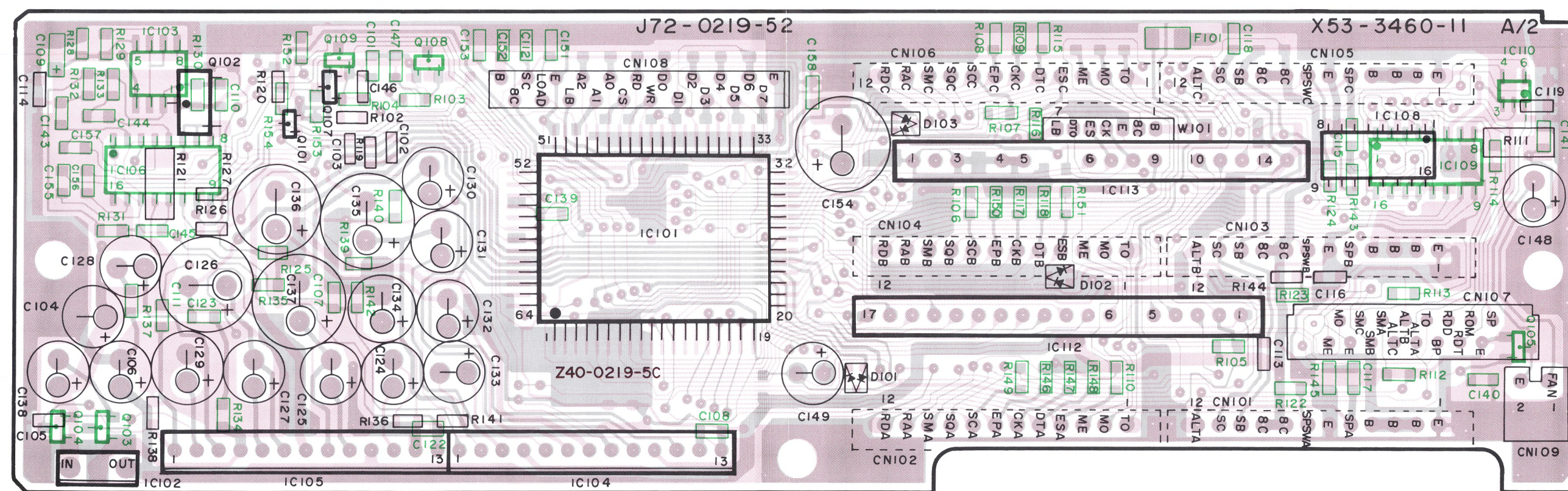
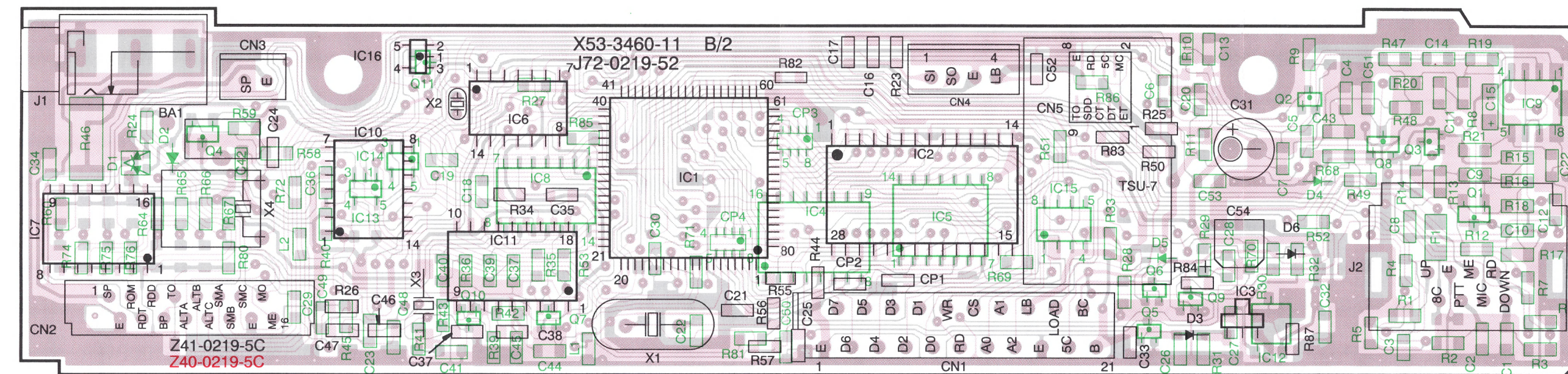


Fig. 62 220 MHz band adjustment: Component layout (upper view)

CONTROL UNIT (X53-3460-11)
(Component side view)

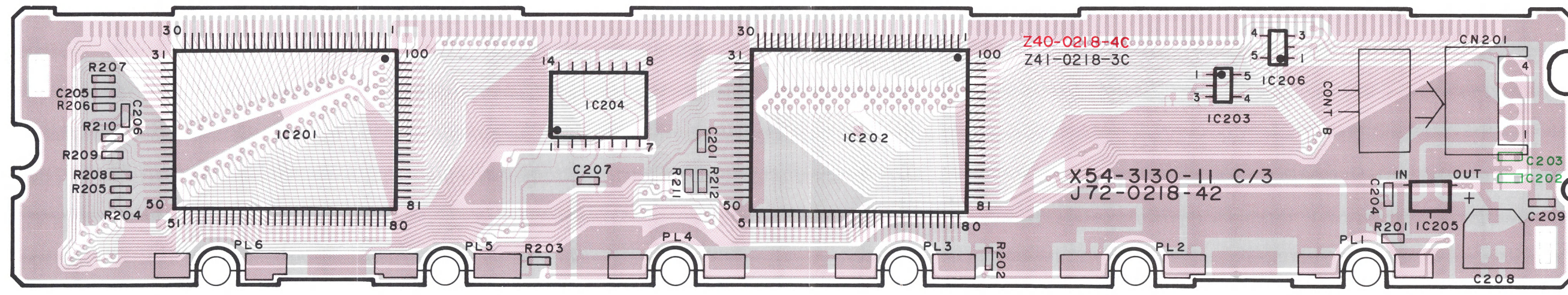
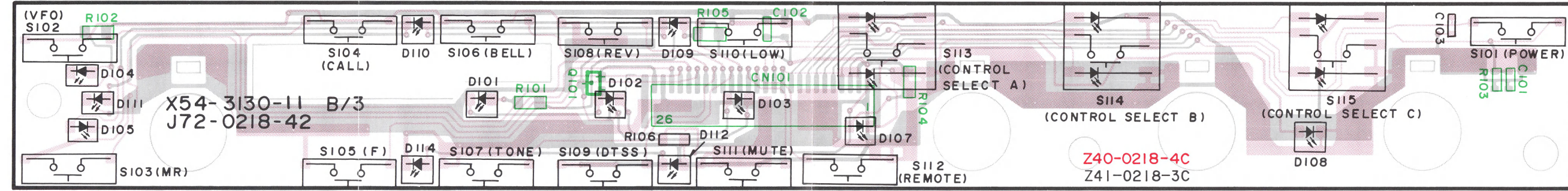
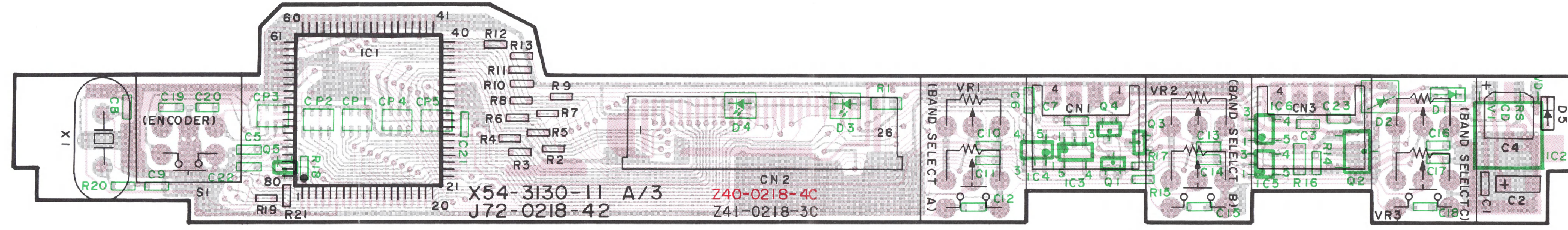


CONTROL UNIT (X53-3460-11)
(Foil side view)

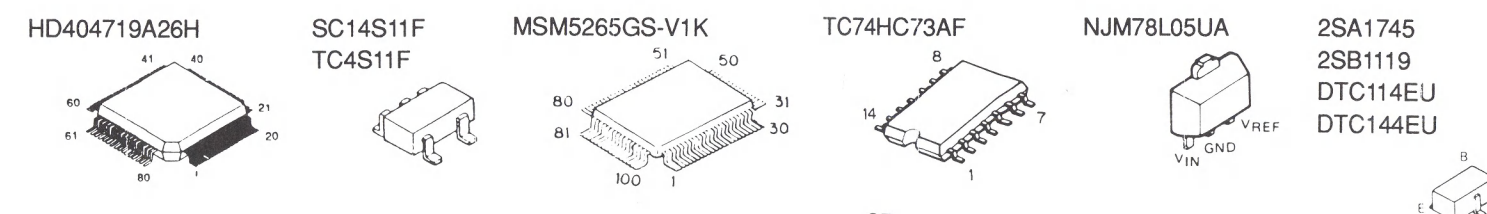


TM-642A PC BOARD VIEWS

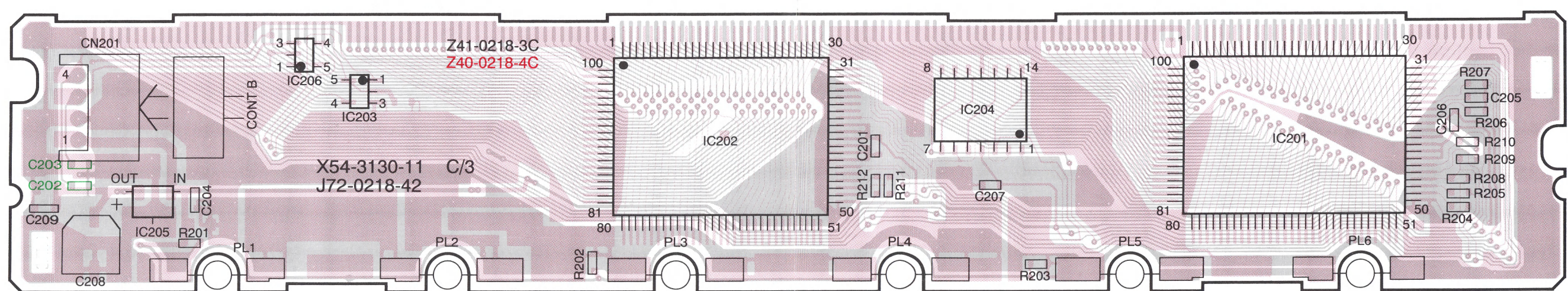
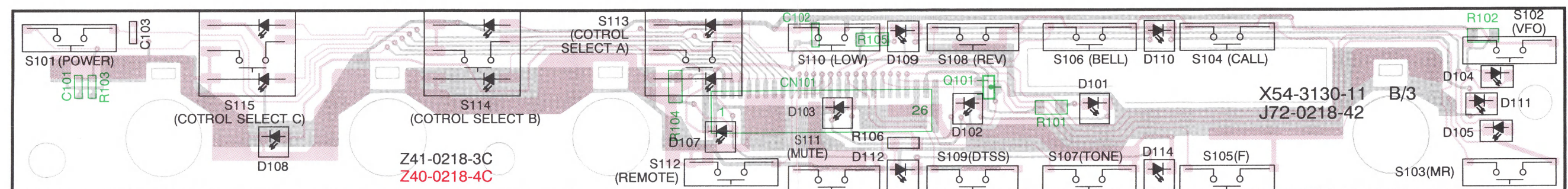
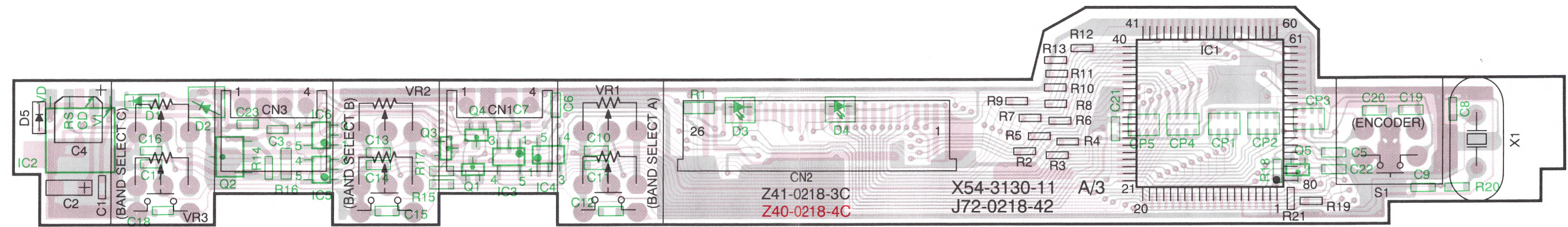
DISPLAY UNIT(X54-3130-11)
(Component side view)



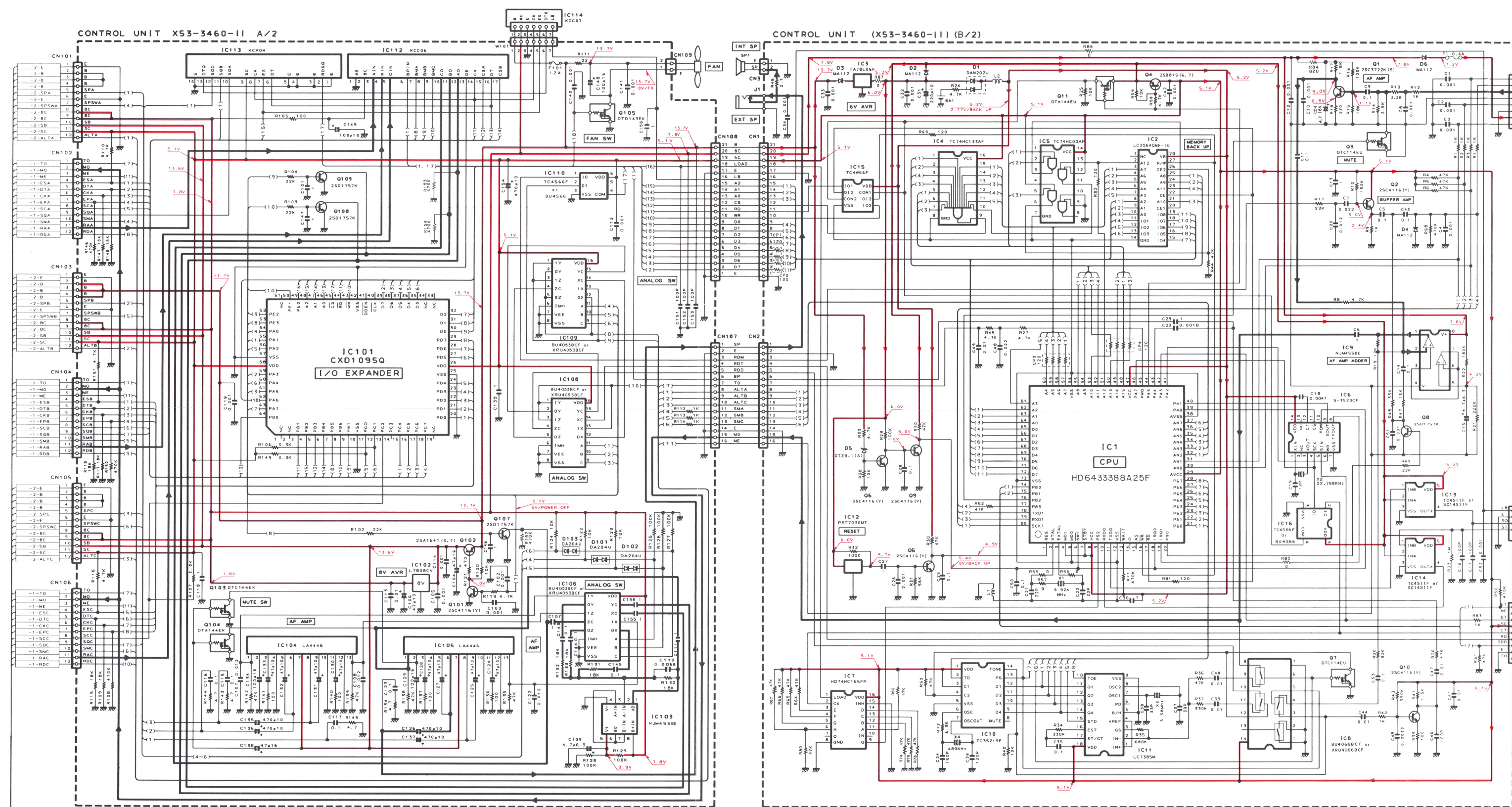
Component side pattern
Foil side pattern



DISPLAY UNIT(X54-3130-11)
(Foil side view)

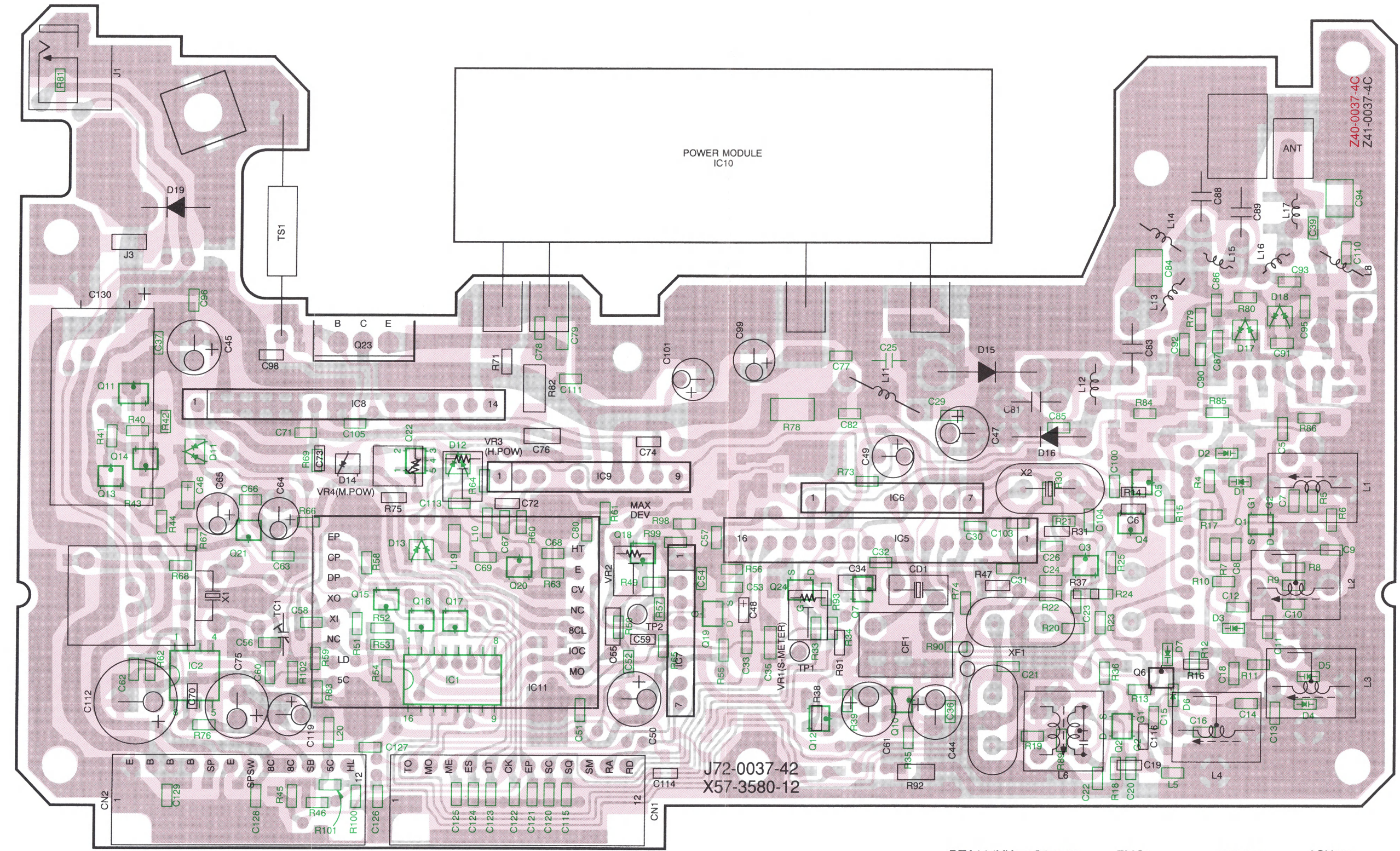


Component side pattern
Foil side pattern



TM-642A PC BOARD VIEWS

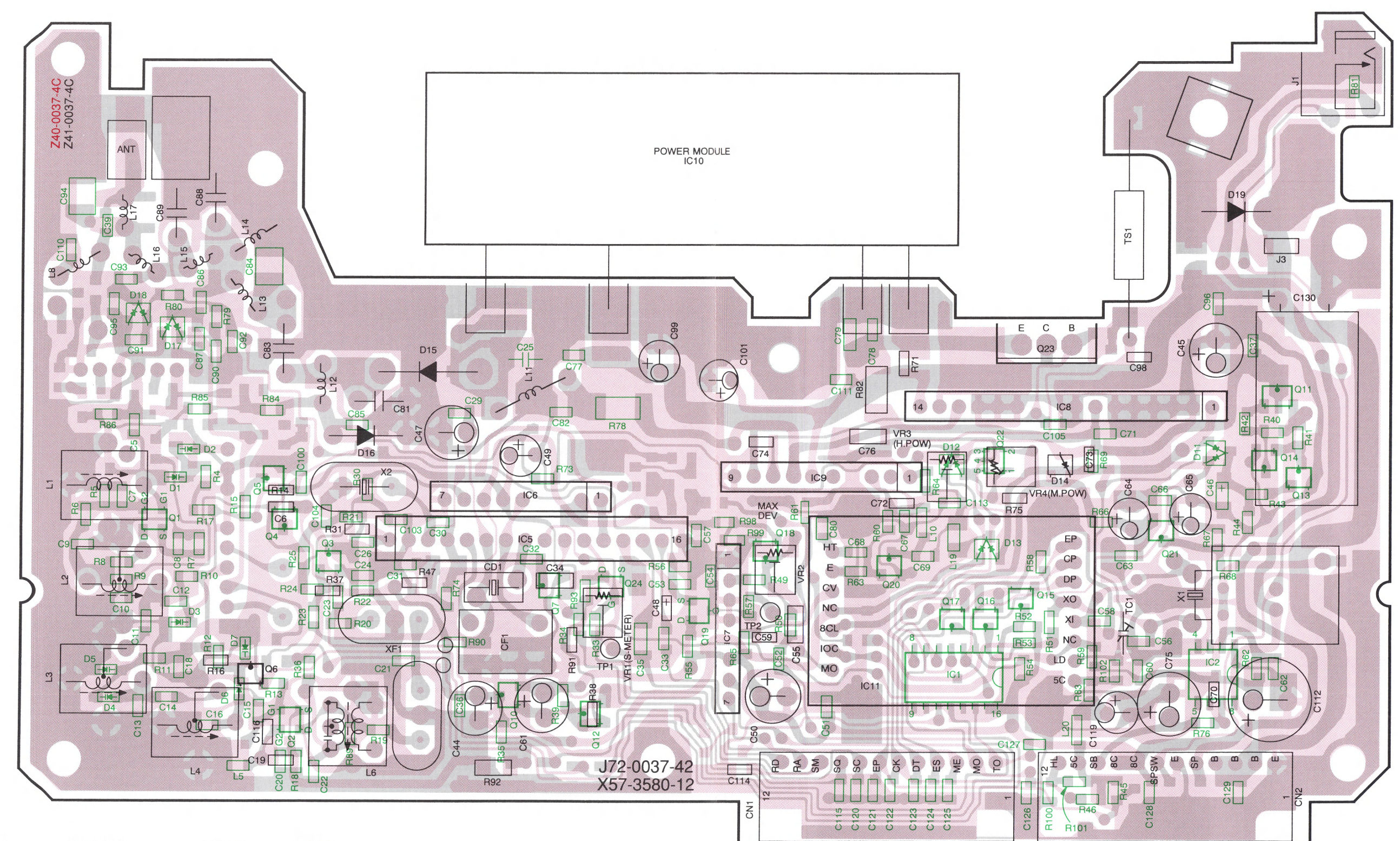
144M TX-RX UNIT (X57-3580-12)
(Component side view)



Red outline : Component side pattern
Grey outline : Foil side pattern

- DTA114YK 2SA1362 FMG1 2SK208 3SK131
DTC123JK 2SB1119 KCB11
DTC143EK 2SC2712 KCD05
DTC144EK 2SC2714
DTC144WK 2SD1757K

144M TX-RX UNIT (X57-3580-12)
(Foil side view)



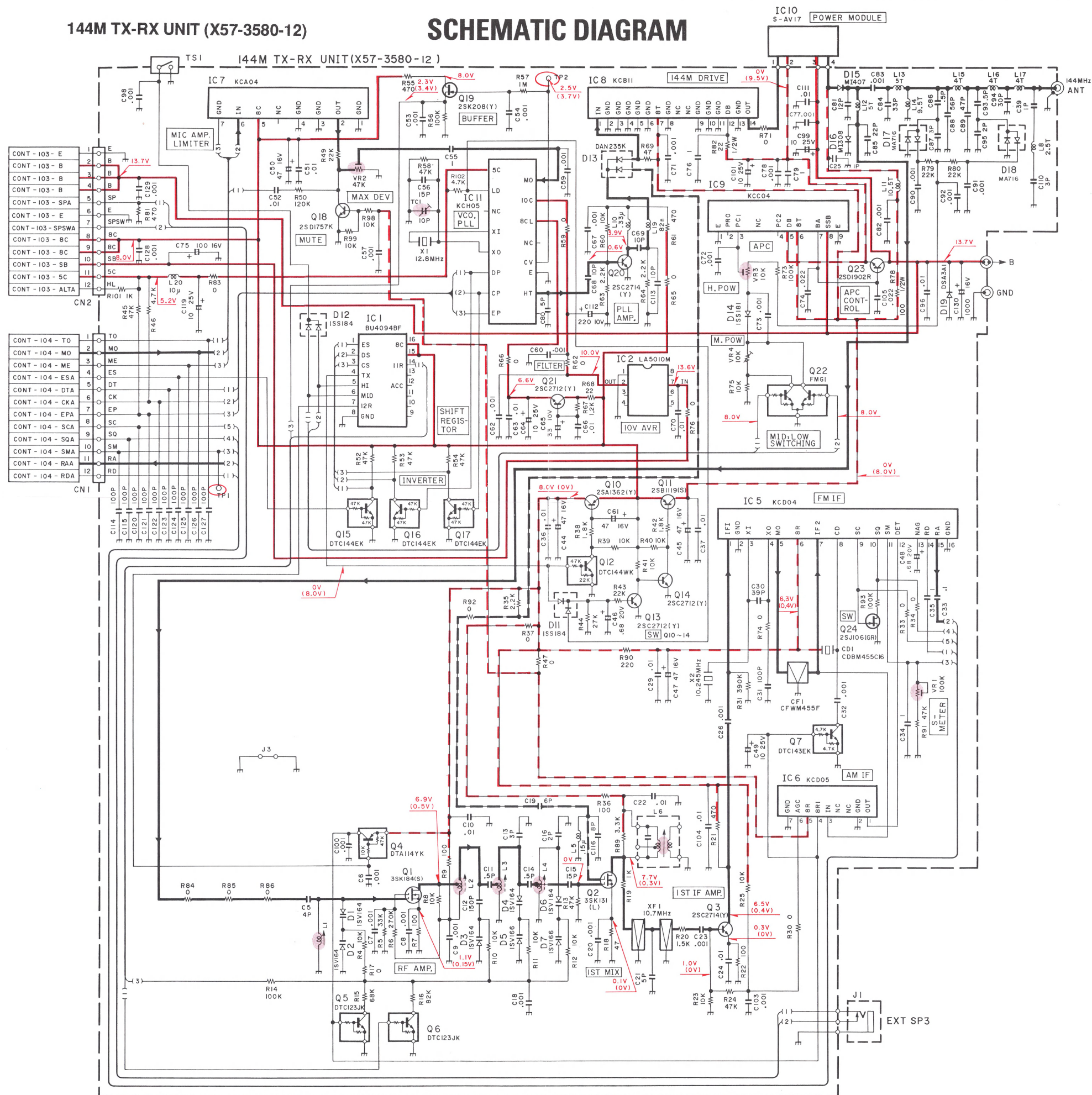
Red outline : Component side pattern
Grey outline : Foil side pattern

- DTA114YK 2SA1362 FMG1 2SK208 3SK131
DTC123JK 2SB1119 KCB11
DTC143EK 2SC2712 KCD05
DTC144EK 2SC2714
DTC144WK 2SD1757K

144M TX-RX UNIT (X57-3580-12)

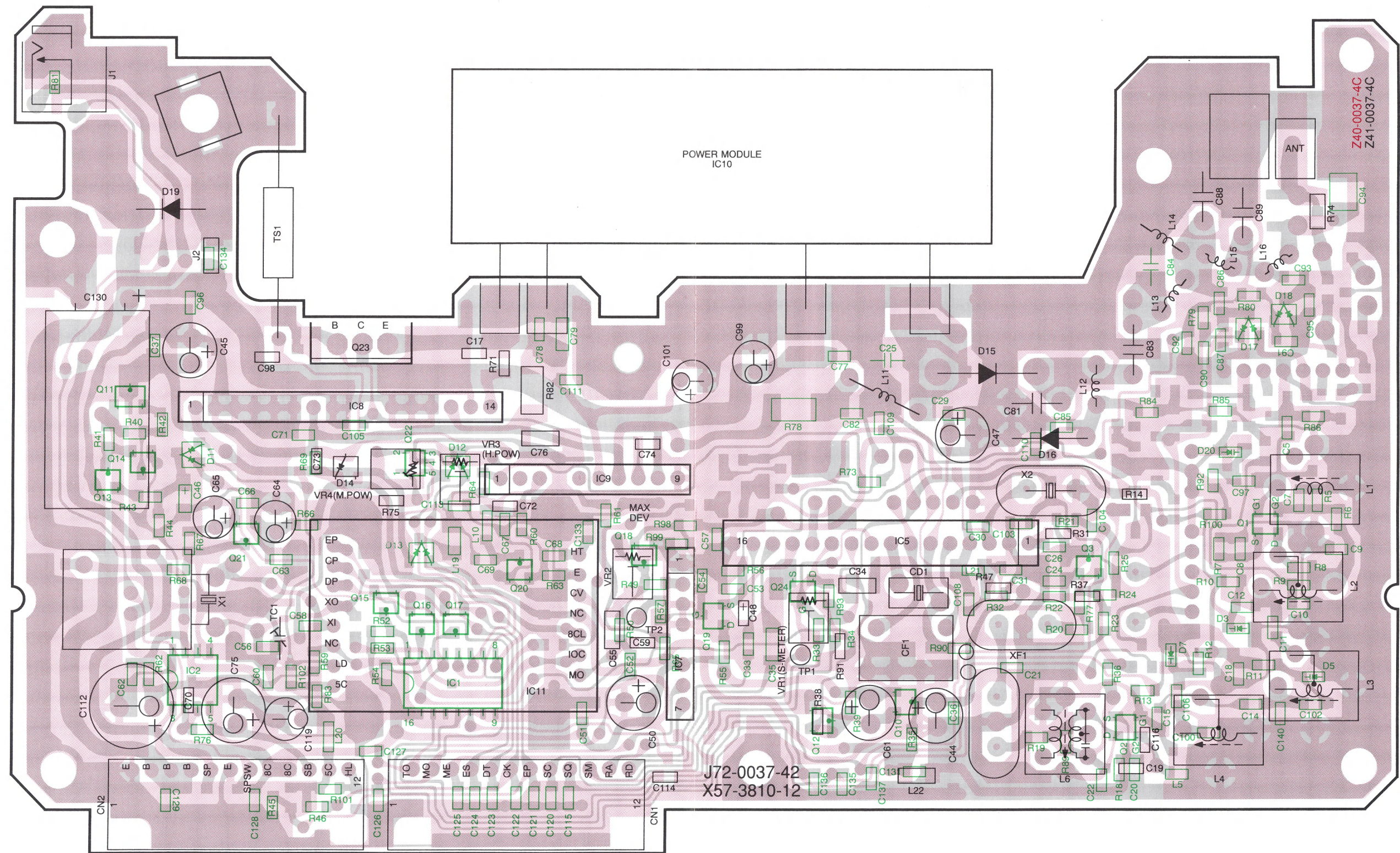
SCHEMATIC DIAGRAM

TM-642A

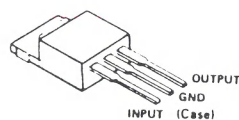


PC BOARD VIEWS

220M TX-RX UNIT (X57-3810-10)
(Component side view)



KCA04
KCB15
KCC04
KCD04
KCH08
2SD1902R



DTC144EK
DTC144WK
2SA1362
2SC2712
2SC2714
2SD1757K



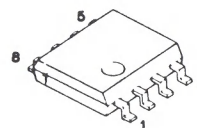
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FMG1



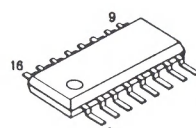
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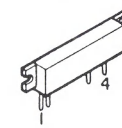
3SK184



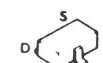
BU4094BF



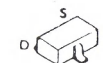
M57774





2SK208



2SJ106



 : Component side pattern
 : Foil side pattern

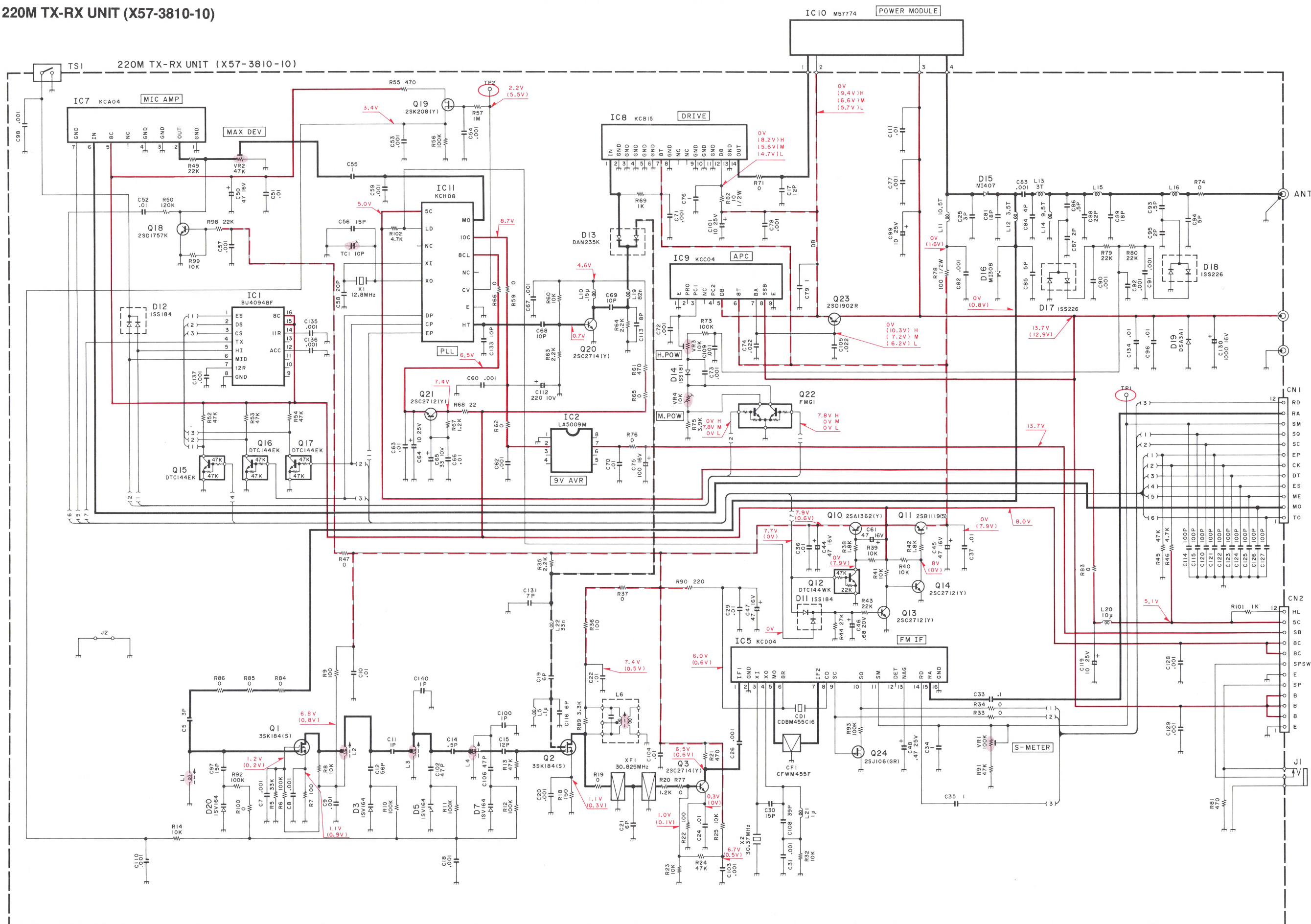
PCB layout for a radio receiver, showing various components and their connections. The layout includes a large 'POWER MODULE IC10' at the top, a 'MAX DEV' section with a variable capacitor, and a 'VR1(S-METER)' section. The bottom edge features a connector 'CN1' with pins labeled RD, RA, SM, SQ, SC, EP, CK, DT, ES, ME, MO, TO, and a connector 'CN2' with pins labeled HL, 5C, SB, 8C, 8C, SPSW, E, SP, B, B, B, E. The layout is populated with numerous components labeled with callouts like C1, R1, Q1, D1, L1, etc.

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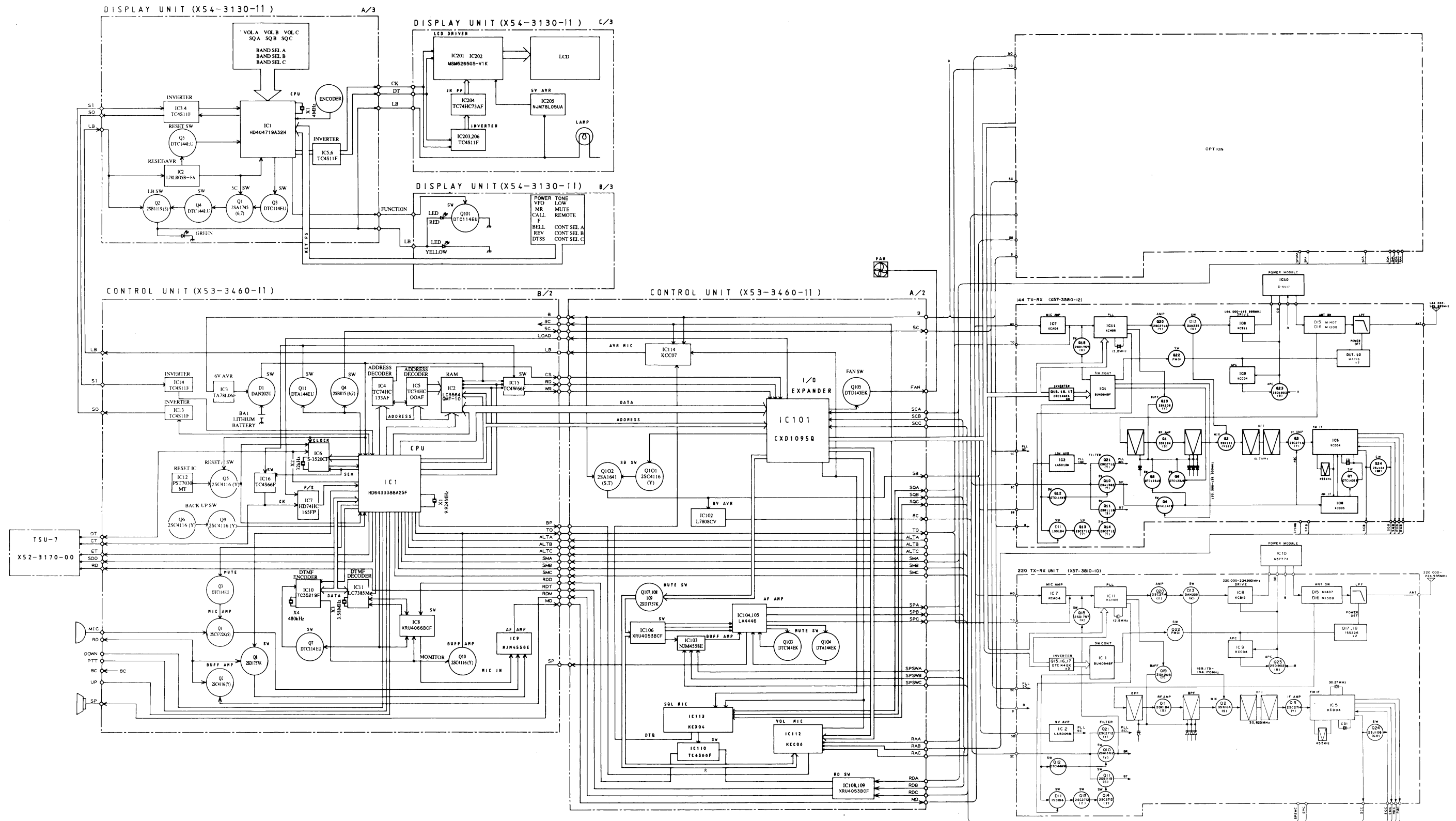
220M TX-RX UNIT (X57-3810-10)

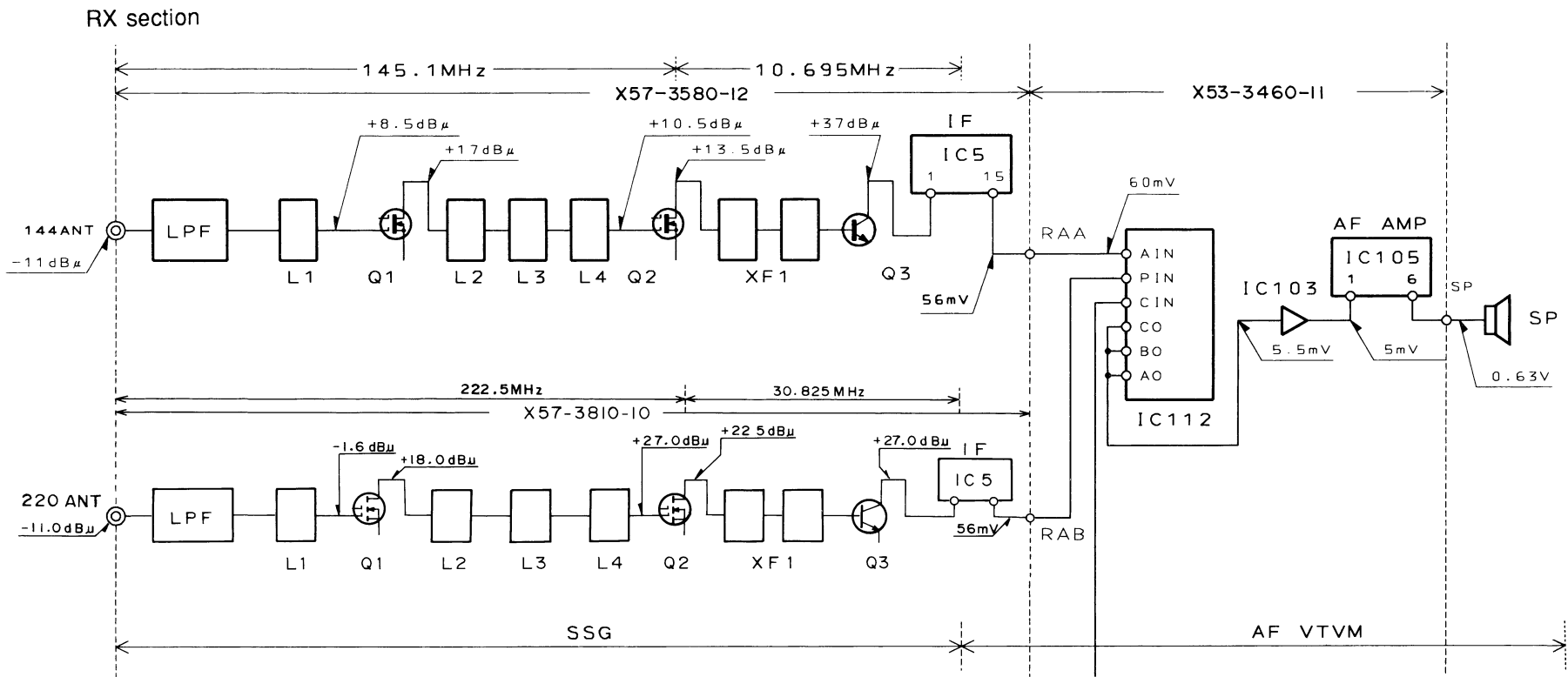
SCHEMATIC DIAGRAM



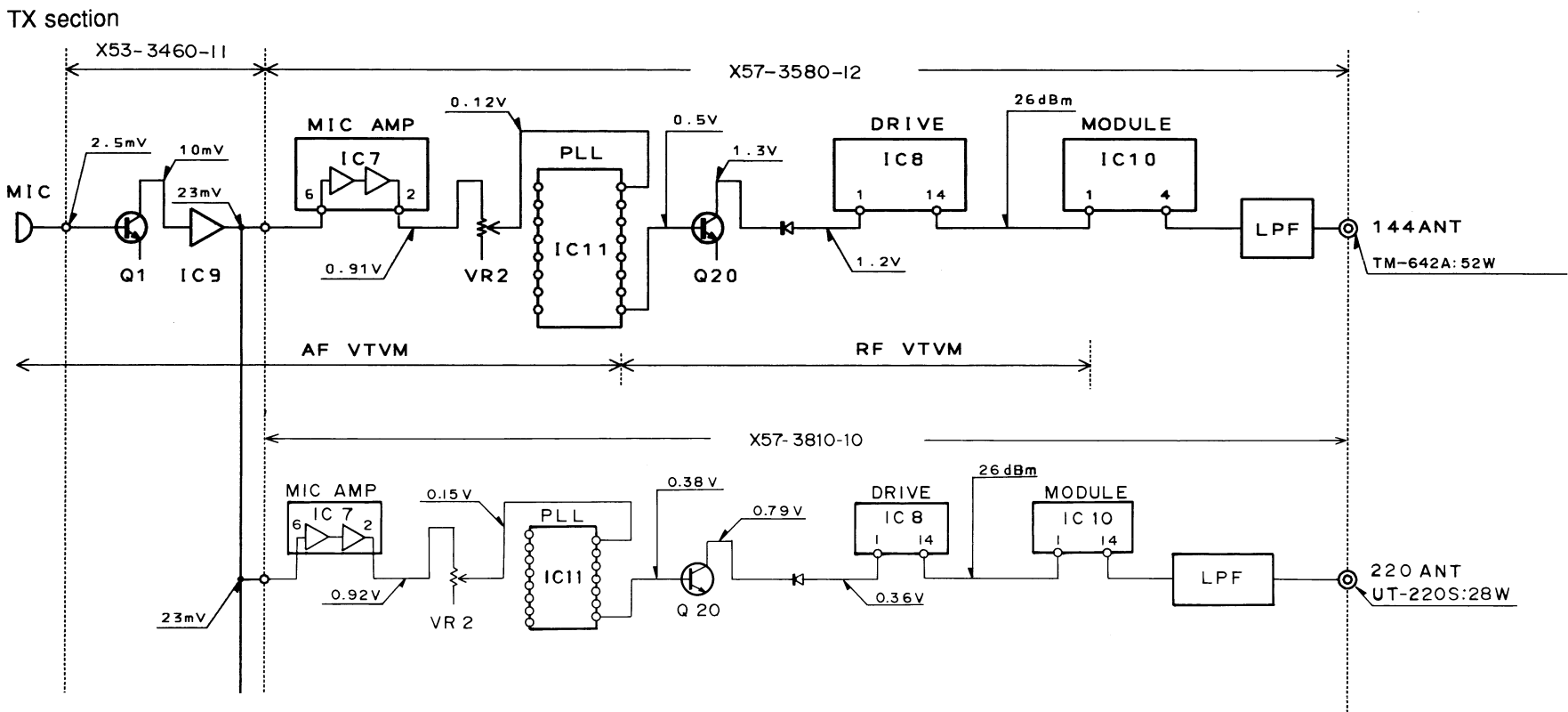
TM-642A TM-642A

BLOCK DIAGRAM





1. SG input level for which a 12dB SINAD are obtained. Measured by connecting the SG to each point via a 0.01μF capacitor.
2. AF level obtained when the AF output level is adjusted for 0.63V/8Ω with the front panel AF VOL control. Measure with AF voltmeter connected to the speaker jack, receiving a 40dB EMF SSG signal modulated at 1KHz, DEV 3KHz.



1. AG is set so that MIC input becomes 3kHz DEV at 1kHz MOD.
2. Transmitting frequency; 145.0MHz, 220.0MHz.
3. HI/MID/LOW SW: HI
4. APC SW: OFF

SPECIFICATIONS

			144 MHz Band	220 MHz Band
GENERAL	Frequency range (MHz)		144 ~ 148	220 ~ 225
	Mode		F3E (FM)	
	Antenna impedance		50 Ω	
	Operating temperature		-20 °C ~ + 60 °C (-4 °F ~ +140 °F)	
	Power requirements		13.8 VDC \pm 15 % (11.7 ~ 15.8 V)	
	Ground		Negative	
	Current drain	Transmit mode	Less than 11.5 A	
		Receiver mode	Less than 1.2 A	
	Frequency stability		\pm 10 ppm	
	Dimensions (W x H x D)		150 x 50 x 175 mm	
	Weight		1.5 kg	
TRANSMITTER	Output power	HI	50 W	25 W
		MID	10 W	10 W
		LOW	Approx. 5 W	Approx. 5 W
	Modulation		Reactance modulation	
	Spurious radiation		Less than -60 dB	
	Maximum frequency deviation		\pm 5 kHz	
	Audio distortion (at 60 % modulation)		Less than 3 %	
RECEIVER	Microphone impedance		600 Ω	
	Circuitry		Double conversion superheterodyne	
	Intermediate frequency	1st	10.7 MHz	30.825 MHz
		2nd	455 kHz	
	Sensitivity (12 dB SINAD)		Less than 0.16 μ V (-16 dB μ)	
	Selectivity -6 dB		More than 12 kHz	
	Selectivity -60 dB		Less than 24 kHz	
	Squelch sensitivity		Less than 0.1 μ V (-20 dB μ)	
	Output (5% distortion)		More than 2 W (8 Ω load)	
	External speaker impedance		8 Ω	

Notes:

1. Circuit and ratings are subject to change without notice due to advancements in technology.
2. Recommended duty cycle: 1 minute Transmit, 3 minutes Reception.

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